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ABSTRACT

The major aim of this study was to examine commonly stated goals of Ph.D. programs, to test some of the different means used to promote selected objectives, including ones related to college teaching, research, and other significant services, and to assess how much progress the University of Minnesota Graduate School had made in these directions during the 1935-1956 period. Ph.D.s granted from all departments during the years 1935-1948 and 1954-1956 were inventoried about their post-doctoral achievements and how they viewed their graduate work in retrospect. The Ph.D. degree was defined in the questionnaire in terms of 30 abilities or skills and the recipients were requested to estimate the extent to which they had attained each of these skills while in graduate school and how useful it had been subsequently. Analyses were also made relating these judgments and type of present employment, graduate school major, and preparation received for college teaching. Special attention was given to the subsequent careers and reactions of persons who participated in the Ford Fund College Teaching internship program in the mid-fifties. Comparisons were also made between the responses given by Ph.D.s in a study conducted in 1949 and those given in a 1965 study. (Author/AF)

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minnesota Ph.D.s evaluate their training

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UNIVERSITY OF *Minnesota*

GRADUATE SCHOOL · JOHNSTON HALL · MINNEAPOLIS, MINNESOTA 55455

Office of the Dean

American higher education today is a vast enterprise: it consumes two per cent of the gross national product and involves about four percent of the population, including more than a third of those of college age. The most significant shapers of this important segment of American society, according to observers such as Jencks and Riesman (The Academic Revolution) are the graduate schools. Because of this, one would expect such institutions to be the subject of numerous studies as well as of countless controversies. Yet these bastions of scientific research have seldom turned their methodology upon themselves. Noteworthy recent exceptions to this dearth of self-examination include Berelson's, Walters', and Cartter's appraisals of graduate education. As the present bulletin notes, some individual graduate schools have also critically examined their products to find out how well the students involved have adjusted to career demands and how they currently view their programs of advanced study.

The present study adds to this growing body of evidence by marshalling data regarding recipients of Ph.D. degrees from the University of Minnesota during the 1935-1956 period. Ph.D.s from all departments in the years sampled were inventoried to probe their post-doctoral achievements and their judgments of their graduate work, given roughly a decade to test the worth of such learnings. Rather unique is the attempt to define the Ph.D. degree in terms of thirty abilities or skills and to secure recipients' estimates of the extent to which they had attained each while in graduate school and how useful it had been subsequently. Analyses were also made relating these judgments and type of present employment, graduate school major, and preparation received for college teaching. Of special interest are the subsequent careers and reactions of persons who participated in the Ford Fund College teaching internship program at Minnesota in the mid-1950's. Another significant comparison involves the responses given by Ph.D.s in the initial study (conducted in 1949) and in the more recent one (conducted in 1965 and reported in some detail in the present bulletin), making this a pioneering effort to find out how the doctoral program itself may have changed during this period.

This study is published by the Graduate School of the University of Minnesota and is being distributed to those with interests in current problems in graduate education.

Bryce Crawford, Jr.
Dean

October, 1968

GRADUATE SCHOOL **UNIVERSITY OF MINNESOTA**

SURVEY OF RECENT DOCTORAL GRADUATES

The information requested in the following items will be used in the Graduate School's self-study of its Ph.D. programs. Personal data on the attached slip will be coded and then removed from the questionnaire to provide complete anonymity for the remainder of your responses.

Please consider each question thoughtfully and state your opinions frankly. Only in this way will your responses contribute to a sound appraisal of our graduate programs. Most items can be answered with a check (V) or a brief phrase, but additional comments are most welcome.

PERSONAL DATA

Please check for accuracy and make any needed corrections and additions:

Name:_____ Graduation date:_____

Major-minor:_____ Adviser:_____

Employment record: Please give the dates, employer, and title of position with rank or equivalent for the first position you held after graduation and your present position:

Inclusive dates	**Employer**	**Title of position and rank**
First:_____	_____	_____
Present:_____	_____	_____

Address of present position:_____

Number of full-time positions you have held since receiving your Ph.D.: (Circle one) 0 1 2 3 4 5 6 7 8 9 or more

Characteristics of Your Present Employment

The usefulness of graduate education depends in part upon its relation to positions subsequently held. Hence some additional facts about your present position are needed to interpret your responses.

1) **Current employment status:** (20) _____ employed full time. _____ employed part time (_____%). _____ not employed.

2) **Division of working time:** In the left column estimate the percentage of time devoted to the following activities during the past year. In the right column list the percentages you **would like** to have for these same activities. Both totals should approximate 100%.

Actual		**Desired**
_____%	a) Administration (include supervisory work, staff conferences, etc.)	_____%
_____%	b) Teaching (include preparation, grading, thesis advising)	_____%
_____%	c) Counseling and individual case work with students, clients	_____%
_____%	d) Research, scholarly writing, creative work	_____%
_____%	e) General work (all professional activities not included above)	_____%
100%	(21-25)	100% (26-30)

3) **Earned income:** Would you please state your approximate (to nearest thousand) earned income from January to December 1964. (Include consultation fees, royalties, summer school salary, and other sources beyond regular salary.) $_____ (31-32)

4) **Job satisfaction:** How pleased are you with your present position? Check (V) one. (33)

_____ Thoroughly satisfied. No desire to change jobs at the time.

_____ Satisfied but would consider a change.

_____ Somewhat dissatisfied. Would change if a good opportunity appears.

_____ Thoroughly dissatisfied.

Publications and Professional Activities

5) **Publications:**

a) Has your **thesis** been published (beyond microfilm and printed abstract) in whole or in part? _____ Yes (whole). _____ Yes (Part). _____ No. (34)

b) Number of **books** or **monographs** published (other than thesis). Circle one: 0 1 2 3 4 5 6 7 8 or more (35)

c) **Articles:** Indicate approximate number of articles published in professional journals since receiving Ph.D.: _____ no articles published. (36)

_____ 1 to 3 articles. _____ 7 to 9 articles. _____ 13 to 15 articles. _____ 19 to 21 articles.

_____ 4 to 6 articles. _____ 10 to 12 articles. _____ 16 to 18 articles. _____ 22 or more.

6) _____ Indicate the number (0, 1, 2, 3, etc.) of national or international **professional societies** of which you are a member. (37)

_____ Indicate the number of major **official positions** (president, secretary, committee chairman) you have held in these national or international professional societies. (38)

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Characteristics of Your Graduate School Experience

7) The following items describe abilities, attitudes, or understandings which many students acquire in connection with their graduate program. Some items are applicable to all programs, whereas others are more restricted in their application. Indicate by a check (V) in one of the columns on the left the usefulness of each of these competencies **in terms of your present (or most recent) position.** Also indicate by a check in one of the columns on the right whether this competency was acquired in the Graduate School. (39-74)

Usefulness in Present Position				Acquired in Graduate School	
Constantly Used or Essential 1	Often Used or Valuable 2	Seldom Used or Unimportant 3		Yes 1	No 2
			1. A thorough understanding of your major graduate field.		
			2. Knowledge in minor field.		
			3. Knowledge in collateral field.		
			4. Command of a broad field of knowledge which includes your major field (e.g., humanities, physical sciences, biological sciences, social sciences).		
			5. Ability to do research or produce artistic creations.		
			6. Ability to teach or train others.		
			7. Reading knowledge of foreign language(s).		
			8. Sense of professional obligation and ethics.		
			9. Ability to work with others in professional endeavor.		
			10. Ability to use a wide range of library resources.		
			11. Acquaintance with professional journals in field.		
			12. Ability to organize and present ideas to colleagues.		
			13. Skill in delegating work or responsibilities to others.		
			14. Ability to appraise the professional contributions of others.		
			15. Ability to serve as consultant on problems in major field.		
			16. Possession of a satisfying philosophy of life.		
			17. Ability to supervise research programs.		
			18. Knowledge of public affairs.		

8) **Controversial issues in graduate education:** Listed below are a number of current proposals regarding graduate education. Check (V) the rating which describes your attitude towards each proposal, using the following scale: (10-19)

A—agree or probably agree
?—uncertain
D—disagree or probably disagree

	A	?	D
a) Graduate students should be encouraged to substitute courses in two or three non-major fields for the traditional minor.			
b) Doctoral programs should stress broad understanding, cultivation, and wisdom rather than techniques and skills.			
c) Doctoral candidates preparing for college teaching should get more training in teaching while in graduate school.			
d) Interdisciplinary graduate seminars should be established to explore relationships among various fields of knowledge.			
e) More doctoral dissertations should be of the type that analyzes, integrates, and interprets existing knowledge.			
f) Graduate work should be more closely related to undergraduate work, making for better sequence in learning.			
g) Most graduate students should be able to finish the Ph.D. in a shorter period, e.g., three years for course work and thesis.			
h) The dissertation should be viewed as a "trial run" in which candidates learn research procedures rather than as a "major contribution."			
i) The publication of three or four research-based articles in a scholarly journal should substitute for the dissertation.			
j) A public defense or two or three lectures on the dissertation topic should substitute for the final oral examination.			

9) **Prior teaching experience:** Indicate:

_____ The number of years (0, 1, 2, etc.) you taught a college class that was your **complete** responsibility, before receiving your Ph.D. (20)

_____ The number of years you taught a college class that was your **partial** responsibility (as a teaching assistant or as an intern), before receiving your Ph.D. (21)

_____ The number of years you were an elementary or secondary school teacher, before receiving your Ph.D. (22)

10) **Satisfaction with graduate school experience:** How pleased were you with your total graduate school experience at Minnesota? Check (V) one. (23)

_____ Thoroughly satisfied. Would definitely choose Minnesota if starting graduate work over again.

_____ Very satisfied. Would choose Minnesota again.

_____ Satisfied. Would probably choose Minnesota again.

_____ Somewhat dissatisfied. Would probably choose some other graduate school.

_____ Very dissatisfied. Would definitely choose some other graduate school.

11) **Motives for leaving teaching:** This item is designed for those who have taught for a short while but are now pursuing other careers. Please check (V) the reason(s) that motivated you to leave college teaching. Please double check (V V) the one factor that chiefly motivated you to leave college teaching. If you are still teaching, check here _____ and go to item "12." (24)

_____ Felt inadequately prepared to teach in college. (25)

_____ Felt I could make greater contributions to society in another career. (26)

_____ Wanted a job with better financial remuneration. (27)

_____ Wanted a job with better security and prestige. (28)

_____ Did not find the college a very stimulating place to be. (29)

_____ Was advised by friends or family to leave college teaching. (30)

_____ Wanted to do more research and writing than my job permitted. (31)

Preparation for College Faculty Service

The remaining items are designed for persons who have been on college faculties (as teacher, administrator, counselor, or any other academic role) for at least one year since receiving the Ph.D. degree. Others may omit the remainder of the questionnaire.

12) Listed below are certain **skills** and **abilities** often **associated with college faculty service.** Consider each item from two points of view: A) How important is (or was) this skill or ability in **your** college work? B) Was this skill or ability acquired in the Graduate School? (32-55)

A — Importance for Your Faculty Service				B — Acquired in Graduate School	
Indispensable 1	Desirable 2	Unnecessary 3		Yes 1	No 2
_____	_____	_____	1. Skill in planning for effective use of limited time (in the classroom, meetings, etc.).	_____	_____
_____	_____	_____	2. Skill in lecturing (to students, lay groups).	_____	_____
_____	_____	_____	3. Skill in handling discussions.	_____	_____
_____	_____	_____	4. Skill in making demonstrations or using charts, models, slides, and illustrative devices.	_____	_____
_____	_____	_____	5. Ability to outline objectives and organize courses.	_____	_____
_____	_____	_____	6. Familiarity with research materials and methods in subject(s) taught (or in subject of specialization).	_____	_____
_____	_____	_____	7. Skill and practice in doing research in field of specialization.	_____	_____
_____	_____	_____	8. Ability to direct others in the proper use of library resources.	_____	_____
_____	_____	_____	9. A broad knowledge of the American college, its organization, development, purposes, and problems.	_____	_____
_____	_____	_____	10. Skill in advising students on personal, educational, or vocational problems.	_____	_____
_____	_____	_____	11. Skill in interpreting and using results from standardized tests.	_____	_____
_____	_____	_____	12. Ability to work with groups of students in extra-class relationships (e.g., advisers to student organizations).	_____	_____

13) Below are listed some experiences which might contribute to **success** and **satisfaction in college teaching.** Please consider the following items from two points of view: 1) Whether or not you **had** the experience listed. If so, check (V) the "yes" column. 2) If you had this experience, how **valuable** was it? Did you find it to be: VP (very profitable), P (profitable), or NP (not profitable) in preparing you for college teaching? (10-19)

Had Experience			Rating		
1 Yes	2 No		1 VP	2 P	3 NP
_____	_____	1. Outstanding teachers in graduate school	_____	_____	_____
_____	_____	2. Outstanding teachers in undergraduate work	_____	_____	_____
_____	_____	3. A strong program of academic courses in Graduate School	_____	_____	_____
_____	_____	4. Course(s) in higher education in Graduate School	_____	_____	_____
_____	_____	5. A teaching assistantship position while in Graduate School	_____	_____	_____
_____	_____	6. A faculty orientation program at first employing institution	_____	_____	_____
_____	_____	7. Helpful fellow teachers at first employing institution	_____	_____	_____
_____	_____	8. A supervised teaching (internship) experience while in the Graduate School	_____	_____	_____
_____	_____	9. A supervised teaching experience in elementary or secondary schools	_____	_____	_____
_____	_____	10. A supervised teaching (internship) experience in employing college	_____	_____	_____

14) **Teaching assignment** during last year (1963-64) or last year taught:

a) _____ Typical number of **credit hours** taught per term. (20-21)

b) Approximate **percentage of students** classified as:

fresh. and sophs.	_____%	(22)
juniors and seniors	_____%	(23)
graduate students	_____%	(24)
	100%	

15) What are you most interested in, professionally speaking, i.e., what is your primary **occupational identification?** Check (V) one: (25)

_____ Teacher
_____ Teacher-researcher
_____ Researcher
_____ Research consultant
_____ Student adviser
_____ Administrator

16) When did you first seriously consider becoming a college teacher? Check (V) one: (26)

_____ Before starting college.
_____ During undergraduate college.
_____ Between bachelor's degree and beginning of work on Ph.D.
_____ During the course work for my Ph.D.
_____ While having a supervised-teaching (or internship) experience.
_____ While working on my Ph.D. thesis.
_____ After finishing graduate work.

17) How did you become interested in college teaching? a) Please check (V) the factors in the lists below that influenced your choice of career. b) Please double-check (V V) the **one** factor among the 20 listed which you feel had the greatest influence on your choice. (27-46)

_____(1) High school staff suggested it.
_____(2) College teacher recommended it.
_____(3) College administrator or counselor encouraged me.
_____(4) Parent, friend, or relative favored this choice.
_____(5) Graduate fellowship or assistantship (internship) was offered me.
_____(6) College teaching job was offered although I hadn't sought it.
_____(7) G.I. benefits enabled me to take advanced work.
_____(8) Armed forces training led me into field.
_____(9) Husband (wife) was or planned to be a college teacher.
_____(10) "Drifted" into college teaching.
_____(11) Became so interested in subject I wanted to continue its study.
_____(12) Desired to work with college-age students.
_____(13) Wanted a job with security and prestige.
_____(14) Felt I could contribute more to my field by teaching in college.
_____(15) Wanted an opportunity to pursue research activities in my field.
_____(16) Felt I could make the greatest contribution to society in this area.
_____(17) Liked working conditions (flexible schedule, vacations, relative independence).
_____(18) Wanted to be a part of the college academic and social life.
_____(19) Desired to emulate a certain college professor.
_____(20) Thought it would offer more intellectual challenge than other careers.

18) In graduate school were there any **faculty models** you hoped to emulate? _____Yes _____No. If "yes," how would you classify their primary occupational identification? Check (V) one: (47)

_____ Teacher
_____ Teacher-researcher
_____ Researcher
_____ Research consultant
_____ Student adviser
_____ Administrator

19) When did you first really begin to think of yourself as a college teacher? Check (V) one: (48)

_____ Before or during graduate work.
_____ After receiving a college appointment but before starting to teach.
_____ In my first year of college teaching.
_____ In my second year of college teaching.
_____ Later. Please specify_____

20) How would you rate yourself as a teacher? Check (V) one: (49)

_____ An excellent teacher.
_____ A very good teacher.
_____ An adequate teacher.
_____ Average but with limitations.
_____ A rather poor teacher.

(O)

Minnesota Ph.D.s Evaluate Their Training

A Study of the Relationship of Various Ph.D. Programs to Later Career Service and Satisfaction

By ROBERT T. ALCIATORE
Associate Professor and Director of
Programs in Higher Education
Oklahoma State University

and

RUTH E. ECKERT
Professor of Higher Education
University of Minnesota

October, 1968

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Chapter I

PURPOSES AND PROCEDURES

Graduate schools constitute the vital "energy-core" of America's extremely complex system of colleges and universities. Growing more rapidly than any other sector of higher education, they prepare faculty members for all types of collegiate and advanced programs. In addition, leaders in industry, government, elementary and secondary education, and practically every other agency of technological, social, and cultural advancement are being trained in the approximately 600 institutions that offer master's programs and especially in the 250 that award the Ph.D. or other recognized doctorates. This country has clearly "hitched its destiny to the star of education," and nowhere is this more apparent than in the colossal present investment in graduate education and research.

Although the merits and weaknesses of graduate programs have been almost continuously debated since the latter emerged, late in the 19th century, as a significant feature of American higher education, seldom have these claims been supported by evidence. Paradoxically, the agency whose prime purpose has been to advance research and scholarship has seldom turned the spotlight of inquiry on its own procedures and especially on the products emerging from its well-established programs. But emotionally toned indictments and defenses of conventional practices are today giving way in some places to sober inquiry into the purposes of such advanced study and into how well these are being fulfilled.

The present report summarizes one such effort, launched at the University of Minnesota with the support of top administrators, members of over a hundred departments offering doctoral studies in the 1935-56 period, and more than 1700 persons who earned the Ph.D. degree during selected years of this period. Specifically these studies were aimed at identifying the types of skill and knowledge which persons who received their doctorates sometime ago were using in their current work. Also sought were appraisals of the values of these abilities and the degree to which the latter had been acquired during graduate years. Since most persons who receive the Ph.D. join college faculties, special attention was given to the prepa-

ration received for their oncoming tasks as teachers. Thus candidates who had held teaching internships, had taught college classes, or had taken courses in higher education were compared on relevant questions with persons without such orientation.

The University of Minnesota seemed to be an appropriate place on several counts for conducting such a study. First and foremost, it has played an important role nationally in graduate education. Berelson's study (4), for example, places Minnesota tenth in the total number of doctorates produced during the period studied and ninth in its faculty's contributions to learned journals. Quality ratings by Hughes (23), Keniston (24), and Cartter (9) also point up the generally high rating of Minnesota in graduate education. In the latter's recent assessment of the quality of graduate programs, Minnesota's programs in Genetics, Medical Sciences, Biochemistry, Physiology, Biosciences, and Psychology ranked among the top ten in the country, with practically all the remaining ones within the top twenty. Other reasons for centering the present investigation at Minnesota included the varied programs offered, including some with a specific focus on college teaching, and the University's early and continuing leadership in institutional self-study.

Importance of Evaluating Graduate Education

Approximately 17,000 Ph.D.s left American graduate schools in 1966 to assume leadership positions in education, government, and industry. The character and quality of the training that they and earlier graduates received is therefore of prime significance. Because of this, some recent efforts have been made to assess the strengths and weaknesses of various institutional programs and, in a few instances, of graduate education in general. Both local committees and regional and national commissions have been weighing the merits of intensive specialization vs. more broadly structured programs, of "pure" vs. applied types of research, and of the cultivation of scholarship *per se* vs. the preparation of qualified practitioners, to cite only three vigorously discussed issues. In the process of doing so, they have explored and, in some cases, changed certain long-standing requirements for master's and Ph.D. degrees or instituted new degrees.

In seeking to "take stock" of their programs, faculty groups have occasionally solicited the aid of their graduates to discover their later professional affiliations, achievements, and goals; their contributions as interested community members and citizens; and their current evaluation of their educational experience. Such information can provide important source material for discussion and action and, when coupled with appraisals made by training and employing groups, provide a sound basis for evaluating educational efforts.

Since most Ph.D. recipients join academic staffs, graduate schools offer some opportunities, beyond the candidates' subject specialization, to prepare for such a career. Service as a teaching assistant or junior instructor is the most common means, though seldom designed and supervised with its training potential clearly in mind. More than a hundred of the larger universities also offer courses and seminars in higher education, typically including one or more dealing with college teaching. Some institutions have developed minors or collateral fields in college teaching, and a few have more elaborate programs. Illustrative of the latter is an experimental internship program in college teaching which the Ford Foundation cosponsored in eighteen colleges and universities, including Minnesota, between September 1953 and June 1956. Evaluation of these special efforts, as well as of more general aspects of the Ph.D. program, promised to throw light on the question of how effectively candidates have been prepared for their oncoming professional roles.

The Need for Follow-Up Studies

What should Ph.D. programs aim to accomplish? Few questions in the field of higher education have evoked so many and so diverse responses. This question really includes two fundamental queries: First, "Who should decide?" Should it be the graduate faculty that confers the degree, the students who apply for it, or the institutions that employ the recipients? To what extent, in other words, should conventional programs be reshaped in the light of consumers' demands or findings from "market research"? The second concerns the nature of the program, namely: "Should the Ph.D. be primarily a practitioner's or a researcher's degree?" Or to put the question more specifically: What type of specialization best prepares candidates for their diverse jobs? Should further breadth in liberal education

be promoted? How far should specialization be extended during graduate years? How much work should be required or encouraged in related fields? What specific preparation, if any, should be given for teaching? How can a continuing interest and competence in research be developed? Should the language requirement and final examination be changed? Surprisingly few answers based on empirical findings have been given to the above questions.

Of the more than two hundred articles and books reviewed in planning this study only an occasional one examined in any depth the later professional needs of Ph.D. candidates. The Hollis study (22), which explored the effectiveness of graduate education as assessed by the producing, employing, and receiving groups, was made almost thirty years ago. Scattered studies have since been reported by a few institutions, notably Harvard (16), Radcliffe (12), Florida State (17), Columbia (10), Pennsylvania (24), Pittsburgh (1), Georgia (6) and Berkeley (21). Among recent investigators, only Berelson (4) asked a nationwide sample of Ph.D.s in all fields to criticize their training in the light of their present employment. His conclusions, however, need confirmation within individual institutions. Although a few investigators canvassed alumni reactions to various developments or innovations in graduate education, none compared members of an experimental teaching program with other Ph.D. graduates a decade later on both vocational success and personal satisfaction with their advanced training.

Most writers simply expressed opinions about how much breadth, research training, and orientation to teaching should be included in Ph.D. programs. Very few, for example, had investigated how valuable these skills are to Ph.D.s in their present employment, as did Buswell and McConnell (7) recently for persons awarded Ph.D.s and Ed.D.s in Education in 1954 and 1964. Reports of college teaching internship programs can be similarly criticized, for all but one reviewed were purely descriptive. Diekhoff's study (13) was partly evaluative, but since his materials were collected immediately after the 1953-56 Ford Fund program, they do not include appraisals in the light of later academic employment.

Objectives of the Study

Follow-up studies of persons awarded the Ph.D. degree can potentially throw light on the extent to which these individuals

believe that certain declared goals of graduate education were accomplished and how valid such objectives appear in the light of their subsequent experiences. The present investigation, which utilizes data from an earlier unpublished study made at Minnesota under Robert J. Keller, director at that time of the Bureau of Institutional Research, as well as those recently gathered, permits comparisons of persons in all disciplines who had earned a Minnesota Ph.D. in selected years (1935-1948 and 1954-1956). With these individuals classified in various ways, but principally with respect to training patterns and employment, the analyses were planned with four purposes in mind:

1. to provide helpful information to the Graduate School and individual departments on the later careers of Ph.D. graduates and these individuals' appraisals of their doctoral programs.
2. to compare persons who entered different types of employment on earlier training patterns, current job responsibilities, and attitudes toward both their present work and their graduate school preparation for this.
3. to compare persons who received special preparation for teaching with other graduates on career choice and satisfaction and on judged attainment of certain graduate school goals.
4. to determine significant shifts over the period studied in employment patterns, in the perceived emphasis given various aspects of training, and in satisfaction with graduate school practices.

The major aim was thus to examine commonly stated goals of Ph.D. programs, to test some of the different means used to promote selected objectives, including ones relating to college teaching, research, and other significant services, and to assess how much progress the University of Minnesota Graduate School had made in these directions during the approximately two decades involved.

Hypotheses Guiding the Study

Certain conjectures or hypotheses guided the development of the study design and instruments.

1. Graduate school departments vary widely in the stress they give to the development of teaching, research, and

other skills—a fact reflected in Ph.D.s' later job placement, activities, and satisfaction; in the nature and extent of their publications; and in their attitudes toward graduate education.

2. Persons holding positions for which their doctoral programs specifically prepared them will show greater job satisfaction and more positive attitudes toward their graduate experiences than other candidates.
3. Individuals who had some specific preparation for college teaching will be more likely than other graduates to enter and remain in this field, to rate themselves highly as teachers, and to be well satisfied with their graduate school experiences.

These conjectures were translated into 89 specific hypotheses, all cast in null form and tested, as described later, to determine whether observed relationships exceeded what might be expected on a chance basis. Significant findings will be reported in the second and third chapters and summarized in the concluding one. However, failure to isolate many variables, such as differences in the abilities, interests, and personality characteristics of persons attracted to various major fields and types of employment, obviously preclude any sweeping generalizations. But comparisons between sub-groups on judged attainment and usefulness of certain skills and abilities suggest how persons with different patterns of training and present employment regard the Ph.D. program and thus afford clues to strengthening its contribution.

Plan of the Study

The present study embodies the ideas and cooperation of many people interested in graduate education, particularly the graduate dean and his associates, chairmen of departments, the staff of the Bureau of Institutional Research (for the initial study), and more than 1,700 Ph.D.s who supplied the basic information.

Earlier Minnesota Study

In 1948, sixty years after Minnesota granted its first Ph.D., Theodore C. Blegen, who was then dean of the Graduate

School at the University of Minnesota, suggested that information be collected about the accomplishments, scholarship, and research activities of the University's doctoral graduates. The Graduate School Committee on the Preparation of College Teachers endorsed the idea, which the Bureau of Institutional Research translated, under Robert J. Keller's leadership, into a follow-up study of former Minnesota Ph.D.s, including all persons granted the Ph.D. between July 1935 and June 1949.[1] Exceptionally good cooperation was secured, as evidenced by a 91.0 per cent return from 1139 persons eligible for inclusion. A full report was never published, but many tables were prepared for internal use and a short preliminary report by Harold Mitzel and Robert J. Keller (27) appeared in 1954.

The Current Study

Although interest had been expressed many times in updating this early study, the specific concern that triggered the present appraisal was a desire to find out what had happened to participants in a college teaching internship program, subsidized by the Ford Foundation in the mid-1950's in fifteen selected colleges and three universities (Columbia, Chicago, and Minnesota). At Minnesota this took the form of a one-year induction to college faculty service given to thirty-three selected Ph.D. candidates, during the 1953-55 period, who had passed their preliminary oral examination. The program included a seminar on college teaching and related subjects, an opportunity to observe good teaching and to teach one or more college classes under supervision, and systematic initiation into other aspects of the academic life. Receiving the same stipend given beginning instructors, interns were expected to give their full time to these activities, thereby delaying somewhat completion of the dissertation requirement.

Some limited information was collected from interns and their mentors during and at the conclusion of this experience, but all persons concerned urged a later follow-up in which interns would evaluate their experience in the light of their current faculty service. This type of study was not undertaken, though, until Minnesota initiated the present appraisal.

Instead of limiting this study to the intern group, the present investigation includes all Ph.D.s, whatever their depart-

[1]Designated in this report as 1935-48, following the general practice in both fiscal and academic reporting of using the initial date for the entire year.

mental affiliation or anticipated vocational goal, who received their degrees during the three years (1954-1956)[2] following institution of the internship program. Since the present report also draws upon findings from the unfinished 1935-48 study, it constitutes the only report to date in which Ph.D.s of different periods have been compared, and findings systematically related to departmental fields, to specific training received for teaching, and to current employment status.

Development of Instruments

Considerable effort was devoted to formulating the questionnaires used in both the earlier and more recent surveys. The four-page printed blank designed for the Keller-Mitzel study had been developed on the basis of extended faculty consultations and careful search of the literature on graduate education. This was critically reviewed and revised in 1964-65 to obtain information and reactions from more recent Ph.D.s. This, too, resulted in a four-page printed blank (see Appendix) which included many questions pertaining to Ph.D.s' current employment, publications record, and satisfaction with the graduate school program. Reactions were also sought to a list of thirty types of knowledge, skill, and attitude often expected from doctoral studies, with respondents asked to indicate how useful each of these was in their present work and whether or not the particular characteristic had been acquired in graduate school. Suggestions from current doctoral advisers and try-outs with recent Ph.D. graduates aided in refining the instrument.

A second questionnaire, formulated and extensively revised in winter, 1965, was sent to the thirty-three interns. This three-page multilithed blank sought judgments concerning actual and desired emphasis on experiences included in this special program, strengths and weakness of the approaches used at Minnesota, and possible economies or substitutes for the program.

Respondents in the Recent Study

Although special attention was to be given to the thirty-three interns, it was decided, as indicated earlier, to compare them with the 675 other persons who completed their doctoral

[2]As the preceding footnote indicated, these correspond to fiscal years and therefore include all degrees awarded from July 1954 through June 1957.

programs in 1954-56. By selecting these three years, the two groups were matched approximately with respect to the period in which they took their course work and the amount of teaching experience they could have had following their preliminary examination. Although acceptance of a one-year teaching internship delayed completion of the dissertation requirement somewhat, four-fifths of the experimental group had earned their Ph.D. by 1957 and the rest shortly afterward.

Of the 708 people in the sample, 675 were thought to have been contacted by the initial inquiry or one of the two follow-ups.[3] Obtaining their addresses involved considerable sleuthing, for most had left the Minneapolis-St. Paul area in the past decade. The main source of contact was through chairmen or professors in the departments involved, who knew the present whereabouts of the vast majority of these former doctoral students. When such information was lacking, a double postal card was sent to the student's address at the time of his last graduate registration, to try to determine his current location.

Cooperation in the project exceeded all expectations. Almost ninety per cent (89.6) of the 675 persons thought to be contacted, including substantial members of foreign alumni and persons currently on overseas assignments, returned usable questionnaires. Several others sent in completed forms after the tabulations closed, with apologetic notes about their long delay in doing so. Statistical tests showed that the respondents were fully representative of all candidates who received Ph.D.s in the mid-1950's with respect to sex, year of graduation, and major fields of specialization. The same proportion (90.9 per cent) of the thirty-three interns returned the additional questionnaire designed for them.

Analysis and Presentation of Findings

Data obtained from the graduate school questionnaire were coded, punched on computer cards, and analyzed by subject fields, by type of present employment, and by preparation received for college teaching. Responses from the internship questionnaire were hand-tabulated because so few cases were involved.

[3]Thirteen Ph.D.s were known to be deceased, and twenty could not be located.

Statistical analyses included the computation of percentages, means, and medians, and the application of chi-square or other appropriate techniques to test apparent relationships between variables. All differences that met or exceeded the five per cent (0.05) level of significance will be noted in the following discussion.

A description of these Minnesota Ph.D.s' graduate school experiences, current types of jobs, occupational activities, and movements in and out of college teaching is given in Chapter II. Chapter III summarizes their appraisals of and recommendations concerning their doctoral work, with a special analysis included of the reactions of early and later graduates. A description of the Minnesota internship program and of former interns' evaluations given in Chapter IV concludes the presentation of findings. Chapter V restates major findings, draws certain conclusions, and suggests their meaning for graduate education and for future research in this field.

Chapter II

PREPARATION, EXPERIENCES, AND CURRENT JOB RESPONSIBILITIES OF MINNESOTA PH.D.s

This chapter and the one to follow report findings derived from questionnaires sent to 708 individuals who had completed their doctoral studies at Minnesota in the mid-1950's. Comparable findings from the earlier Minnesota follow-up study will be used, where available, to test consistency of responses over approximately two decades.

Organized in five parts, dealing with these Minnesota Ph.D.s' graduate school experiences, current types of jobs, occupational activities, publication records, and movements in and out of college teaching, the present chapter is largely descriptive in nature. The facts and opinions revealed are not only intrinsically interesting but provide important background for interpreting graduates' appraisals of their preparation, given in Chapter III.

Graduate School Experiences

Graduate departments within any school differ in the emphasis they give to various fields of study, in the excellence of the programs involved, and in opportunities explicitly designed to prepare candidates for their future teaching and research roles. The present section summarizes information on some of these points obtained from persons in the recent study and, when available, from those in the earlier one. In the case of graduate majors, where trends over a thirty-year period might be significant, figures are also given for Ph.D.s conferred by the University in 1965.

Graduate School Major

Over 100 fields of study were represented by the Ph.D.s in the recent study sample. These were grouped into ten broad

categories, following the pattern set in the earlier study.[1] Both the number and per cent of Ph.D.s in the 1935-48 and 1954-56 periods who majored in these fields are listed below (Table 1). To indicate how these distributions compare with the current situation, figures are also included for all persons awarded doctorates recently (July 1965-June 1966).

TABLE 1

FIELDS OF SPECIALIZATION OF MINNESOTA PH.D.S AT SPECIFIED PERIODS OVER PAST THIRTY YEARS

Fields of Specialization	1935-1948 N=1315 Per Cent	1954-1956 N=708 Per Cent	1965* N=384 Per Cent
1. Agricultural Sciences	10.0	11.2	8.6
2. Biology & Related Agri. Sciences	18.3	10.3	6.0
3. Education	5.7	9.8	9.4
4. Behavioral Sciences	9.7	19.1	13.3
5. Social Ecologies	11.3	13.8	15.6
6. Humanities	5.8	5.3	8.6
7. Physiological Medicine	10.0	7.2	8.3
8. Clinical Medicine	4.5	2.5	2.1
9. Chemical Sciences	13.4	7.3	7.0
10. Other Physical Sciences	11.3	13.5	21.1

*These are fiscal years, as explained earlier, extending from July of the year designated through the following June.

The number of Ph.D. degrees awarded increased spectacularly during these years, soaring from an average of 88 annually for the 1935-48 period to 232 for 1954-56 and to 384 for 1965. The distribution among various major fields also altered significantly, with "Other Physical Sciences" showing the largest gain (from 11.3 to 21.1 per cent of the total number). Education and other Social or Behavioral Sciences also charted significant advances, whereas the Biological and Chemical Sciences accounted for a smaller proportion of candidates than in earlier years. In general, findings regarding production of Ph.D.s in the natural sciences in the mid-1950's agree with those reported in a Brookings Institute study (29), which showed no significant change in the distribution of candidates during this period, despite the greater availability of support funds for advanced

[1]Analyses were also made by individual departments whenever the number of candidates exceeded eleven, and findings shared with the faculties involved.

studies. But some important shifts have occurred in the past decade at Minnesota, notably in the higher percentage of Ph.D.s granted in Engineering and Other Physical Sciences and some further loss in Agricultural and Biological Sciences.

Preparation for Teaching During Graduate Years

Another meaningful basis for grouping these Ph.D.s is in terms of experiences beyond their subject specialization that may have prepared them for teaching. Three investigated means of doing this included holding a teaching internship of the type discussed in Chapter I, electing courses in higher education, and having full responsibility for a college class prior to graduation.

Using these as a basis for grouping the study sample, five types of preparation for college teaching were defined and the sample classified accordingly (see Table 2). Two graduates in five (40.3 per cent) had had no specific preparation for teaching, as defined above, and practically the same proportion (37.4 per cent) had only pre-graduation teaching. Of the remaining persons, approximately a sixth (17.3 per cent) had taken one or more courses in higher education, whereas only one in twenty (5 per cent) had held a teaching internship.

TABLE 2

GRADUATES CLASSIFIED ACCORDING TO PREPARATION FOR TEACHING

Preparation for College Teaching	N	Per Cent N=601
1. Interns	30	5.0
2. Non-interns with courses in higher education and some college teaching experience	79	13.1
3. Non-interns with courses in higher education and no college teaching experience	25	4.2
4. Non-interns with some college teaching experience but without courses in higher education	225	37.4
5. Those with none of the above types of preparation	242	40.3

College Teaching Prior to Graduation: More than half of the graduates or 55.5 per cent (including interns and many persons who had taken courses in higher education) had had complete

responsibility for at least one college class before they graduated.[2] Most of these had taught for only a year or two, but 8.5 per cent had had extended teaching experience (eight or more years) prior to receiving the doctorate.

Humanities ranked highest in the number of candidates (96.9 per cent) who had taught a college class prior to graduation, followed by Social Ecologies (83.1 per cent) and Education (78.3 per cent). Not surprisingly, the fields that ranked lowest in this respect were the Chemical Sciences (21 per cent) and Clinical Medicine (7.1 per cent).

Service as a Teaching Assistant: More than two-thirds (68.7 per cent) of the study sample had held a teaching assistantship at some point in their training. This was most frequently reported by Ph.D.s in Chemical Sciences (94.4 per cent) and Humanities and Physiological Medicine (both with 84.4 per cent) and least often by those in Education (52.8 per cent) and Agricultural Sciences (37.8 per cent).

Elementary or Secondary School Teaching: More than a fourth (29.6 per cent) of the total sample had taught in the lower schools for at least a year prior to receiving their Ph.D. As might be predicted, most Education majors (85 per cent) and substantial numbers of those in the Behavioral Sciences, Social Ecologies, and Humanities had had such experience, whereas this figure dropped to less than 20 per cent of the remaining six groups.

Proportions of Men and Women

A variable always of interest in discussions of graduate education concerns the sex of the persons involved. Nine-tenths (90.1 per cent) of these Minnesota Ph.D.s were male, which is just about the same figure reported nationally. Clinical Medicine and Chemical Sciences had only male candidates, whereas in Education and the Behavioral Sciences women had gained the largest foothold, constituting one out of five candidates (see Table 3).

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[2]Tables for many comparisons not given in the present bulletin may be found in the full report on the 1954-56 study (Alciatore, Robert T., "The Relationship of Conventional and Experimental Ph.D. Programs to Later Faculty Service and Satisfaction," Ph.D. Thesis, University of Minnesota, 1965).

TABLE 3

SEX OF GRADUATES OF VARIOUS DIVISIONS

Field of Specialization	Present Study Male N=676 (Per cents based on major field)	Female N=32
Agricultural Sciences	95.5	4.5
Biology & Related Agricultural Sciences	95.1	4.9
Education	79.7	20.3
Behavioral Sciences	78.3	21.7
Social Ecologies	92.8	7.2
Humanities	83.4	16.6
Physiological Medicine	90.7	9.3
Clinical Medicine	100.0	—
Chemical Sciences	100.0	—
Other Physical Sciences	98.8	1.2

Types of Jobs

Other items of obvious concern relate to the kinds of positions these graduates have held or are currently holding and their stability of employment since earning their doctorates.

Employment Status

Almost all (97.3 per cent) of the 1954-56 Ph.D. recipients are employed full time. Thirteen (2.1 per cent) are employed part time, and only three (.5 per cent) are full-time housewives and hence technically unemployed. The earlier study showed similar proportions (96.8 per cent employed full time, 2.1 per cent part time, and 1.1 per cent as homemakers not otherwise employed).

First and Present Employment

Colleges and universities were currently employing about two-thirds of Minnesota Ph.D.s of the last quarter-century (66.6 per cent of the mid-1950's graduates and 64 per cent of the earlier ones). This is somewhat above the 60 per cent nationally reported by Berelson in 1960. As Table 4 indicates, about three-fourths of the 1954-56 doctoral recipients who held academic appointments in 1965 were in multi-purpose institutions (universities). The others were predominantly in four-year liberal arts or state colleges, with only a scattering in separate professional schools or junior colleges.

TABLE 4

TYPES OF FIRST AND PRESENT POSITIONS OF MID-1950's GRADUATES

Type of Position	After Graduation Per Cent (N=601)	Present Per Cent (N=601)
1. Business and Industry	14.3	12.7
2. Government or Public Service	16.5	15.3
3. University Employment	47.8	50.4
4. College Employment	14.0	16.2
5. Others or no information	5.4	5.4

Governmental and other public service agencies and business and industry were also employing sizeable percentages (15.3 and 12.7 per cents respectively of recent graduates and 11 and 25 per cents of earlier ones). Elementary or secondary schools (1.2 per cent) and private practice (1.8 per cent) have attracted very few recent Ph.D.s, as was true also of the earlier graduates. In later analyses based on type of employment, persons in these latter two groups were combined with those for whom such information was missing into a "miscellaneous" category.

Comparisons of jobs taken immediately after graduation with those currently reported show a shift of about five per cent in favor of academic employment. Great expansions in enrollments and in university-based research programs undoubtedly help to explain this, which runs counter to the slowly declining percentage of Ph.D.s nationally, up until 1960 at least, who were joining academic staffs.

Present Employment of Graduates in Various Major Fields

Whereas colleges and universities attract all types of specialists, business and industry employ mostly majors in Chemical and Other Physical Sciences, and government and public services employ chiefly persons prepared in the Agricultural, Biological, and Behavioral Sciences (in that order). More than three-fourths of Minnesota graduates who majored in Humanities, Social Ecologies, Education, and Behavioral Sciences held academic positions ten years later (see Table 5). Agricultural and Biological Sciences sent around half of their candidates to colleges or universities and a third to government and public service. Half of the graduates from the two medical divisions are in academic roles: the others work for the government or

are engaged in private practice. Physical Science majors (in fields other than Chemistry) gravitate toward academic work (60 per cent) or business and industry (30 per cent). Chemical Sciences majors are unique. Less than 30 per cent go into academic work, whereas almost 57 per cent are employed by business and industry and the remainder by governmental agencies.

TABLE 5

PRESENT EMPLOYMENT OF GRADUATES IN TEN MAJOR FIELDS

MAJOR FIELD	TYPE OF EMPLOYMENT (Per cents based on major field)* Business and Industry	Government and Public Service	University Employment	College Employment	Others
1. Agricultural Sciences	11.1	33.7	50.7	1.5	3.0
2. Biology & Related Agricultural Sciences	11.3	33.9	41.9	11.3	1.6
3. Education	—	8.5	45.7	35.6	10.2
4. Behavioral Sciences	4.4	15.7	58.3	13.0	8.6
5. Social Ecologies	1.2	6.0	63.8	25.3	3.6
6. Humanities	—	—	40.6	56.2	3.1
7. Physiological Medicine	9.3	18.6	60.5	7.0	4.7
8. Clinical Medicine	6.7	26.7	46.7	—	20.0
9. Chemical Sciences	56.8	9.1	22.8	6.9	4.6
10. Other Physical Sciences	30.9	6.2	50.0	9.9	3.0

*Unless otherwise indicated, the total number of cases used in tables in Chapters II and III is approximately 600 (the mid-1950's sample).

Present Positions of Interns and Others With Specific Preparation for Teaching

All of the former interns are presently employed in colleges (33.3 per cent) or universities (66.7 per cent), as are about 80 per cent of those who received some other type of training for teaching. In contrast, only 50 per cent of those with no specific preparation for this role are now on college or university staffs.

Number of Jobs Held and Years in Present Position

Judging from the few positions held since leaving the University and length of employment in their current jobs, Minnesota Ph.D.s are a highly stable group. Typically they have held

only two jobs since graduation, and have been with their present employer 6.3 years. Many (42.3 per cent) have held their present job nine or more years. Neither type of present position nor graduate school major were significantly related to job stability.

Occupational Activity, Salary, and Job Satisfaction

Since one assumption of this study is that a graduate school should take account of candidates' probable vocational destiny, information was gathered as to the amount of time that various groups of Ph.D. recipients currently devote to teaching, research, administration, and other professional activities. Also investigated were the current income and perceived job satisfactions of these groups.

Occupational Activities of Minnesota Ph.D.s

According to self-reports, these Ph.D. graduates are typically giving 29.7 per cent of their time to research activities, 26.6 and 26.3 per cents respectively to administration and teaching, and a very small amount of time to counseling (8.2 per cent) and other activities, including chiefly services beyond the campus (9.2 per cent). This distribution of time is notably different than that reported in most faculty load stud[illegible] of earlier years, reflecting the greatly increased emphasi[illegible]w on research and scholarly writing and the withdrawa[illegible] many top staff from teaching, particularly at the undergra[illegible]uate level.

Job Activities in Employing Institutions: Those in university employment (about 50 per cent of Ph.D. recipients) estimated that they were dividing their time chiefly between teaching (32.4 per cent), research (32.2 per cent), and administration (22.3 per cent). In contrast, those affiliated with junior, liberal arts, or state colleges (which employ 17 per cent of these graduates) give most of their time to teaching (50.0 per cent) and administration (26.2 per cent), with much smaller fractions to research (9.2) and counseling (8.3). In government and public service agencies, which had attracted 15 per cent of these Ph.D. recipients, activities chiefly centered around research (40.0 per cent) and administration (30.6 per cent). Persons employed in business and industry (12.6 per cent of the sample) typically devote 39 per cent of their time to administration and 35 per cent to

research. These latter groups also give some limited time to teaching and the other activities canvassed.

Job Activities of Graduates in Ten Major Fields: Another way of viewing these estimates—and perhaps more significant in a discussion of graduate education—is in terms of how graduates in different subject fields now spend their time (Table 6). Presently devoting the most time to research activities are the typical graduates in Biological (46.5 per cent), Agricultural (42.2 per cent) and Chemical Sciences (40.4 per cent) and in Physiological Medicine (39.9 per cent), whereas former majors in Humanities, Social Ecologies, and Education apparently spend very little time (around 15 per cent typically) on this activity. Conversely, graduates in these three latter subject fields rank highest in time given to teaching activities (51.8, 44.9, and 32.4 per cents respectively—figures that drop to around 15 per cent for graduates in the Chemical and Agricultural Sciences and Clinical Medicine). Specialists in various fields differ less on the amount of time given to administrative activities, from 11.9 per cent for majors in Clinical Medicine to 36.3 per cent for Education majors but typically around 27 per cent.

TABLE 6

PRESENT OCCUPATIONAL ACTIVITIES OF GRADUATES IN TEN MAJOR FIELDS

Type of Academic Major	Median Per Cent of Time Given Specified Activities				
	Teaching	Research	Administration	Counseling	Other Activities
1. Agricultural Sciences	14.1	42.2	26.0	9.3	8.2
2. Biological Sciences	17.5	46.5	23.9	4.8	7.1
3. Education	32.4	14.2	36.3	8.1	9.0
4. Behavioral Sciences	23.6	25.7	29.6	14.0	7.0
5. Social Ecologies	44.9	15.5	27.2	6.5	5.9
6. Humanities	51.8	12.7	24.2	7.3	4.0
7. Physiological Medicine	26.6	39.7	17.7	3.8	12.3
8. Clinical Medicine	14.4	24.7	11.9	7.9	41.1
9. Chemical Sciences	15.9	40.4	29.1	4.8	10.2
10. Other Physical Sciences	21.1	33.3	24.9	8.0	12.4
Total Sample	26.3	29.7	26.6	8.2	9.2

Job Activities of Interns and Other Ph.D.s: To discover whether preparation for teaching may relate to later vocational activities, the interns and other groups classified on this basis were compared on the per cent of time currently given to teaching and other activities. Interns estimated that they spent approximately half (47.9 per cent) of their working time on teaching tasks. This is significantly higher than comparable figures for the other groups, which ranged from a low of 15.2 per cent for those with no formal preparation for teaching to a high of 33.2 per cent for those who had had both course work in higher education and some pre-graduation teaching. As a result of this stress on teaching, former interns give less time relatively to research and considerably less to administrative duties.

Earned Income

The typical Minnesota Ph.D. reported an earned annual income (which was to include regular salary, consultation fees, royalties, summer school stipends, and the like) ten years after graduation of $14,500 ($14,657 was the mean salary). Roughly 10 per cent were earning less than $10,000 and another 10 per cent more than $20,000 per year.

By Types of Employment: The most lucrative employment for Ph.D. graduates in the study sample is in business and industry (average income $18,560). Universities are the next highest paying institutions ($14,825), followed by "other" or miscellaneous types of employment ($14,129) and government and public service ($13,045). The lowest paying positions are in undergraduate colleges, where the average reported income was only $12,458.

By Major Fields: Even greater differences emerged when graduates were classified by their academic or professional specializations. Thus the average earned income of majors in Clinical Medicine ($27,000) was almost twice that of the total sample ($14,657). Majors in Other Physical Sciences were averaging almost $18,000 a year, substantially above the figure ($14,545) reported by the Chemistry majors. Comparable figures for the other seven majors range from around $12,000 to $15,000 (Table 7), with the Biological Sciences and Humanities majors the least well-paid of the ten groups studied.

By Preparation for Teaching: Among groups with special preparation for teaching, those with courses in higher educa-

TABLE 7

EARNED INCOME OF GRADUATES CLASSIFIED BY MAJOR FIELDS

Type of Academic Major	Average Earned Income
1. Agricultural Sciences	$13,849
2. Biology & Related Agricultural Sciences	12,119
3. Education	13,829
4. Behavioral Sciences	14,677
5. Social Ecologies	13,232
6. Humanities	12,567
7. Physiological Medicine	14,927
8. Clinical Medicine	27,000
9. Chemical Sciences	14,545
10. Other Physical Sciences	17,975
Total Group	$14,657

tion but no pre-graduation teaching (a category that included many administrators) led with an average earned income of $15,520 per year. The interns ranked lowest, with an average income of $12,000. However, since interns began post-graduate employment at least a year later than the other Ph.D.s this comparison is less meaningful than others in this study.

Job Satisfaction

More than two-fifths (44 per cent) of Minnesota Ph.D.s expressed thorough satisfaction with their present position. An equal number (43 per cent) said they were satisfied but would consider a change, which is hardly surprising for persons in the early stage of their post-doctoral careers. About one in ten (11.3 per cent) is somewhat dissatisfied and would change his job if a good opportunity appears, but only one per cent appear genuinely dissatisfied. Job satisfaction, as judged by these self-estimates, bears no relation to the particular type of job held, to the graduate field of specialization, or to special preparation received for teaching.

Publications and Scholarly Activities

Since training in research looms large in all doctoral programs, it is important to inquire into the later scholarly productivity of these Ph.D.s. This was probed through questions relating to publication of the doctoral thesis, books other than the thesis, and journal articles. Membership in professional

societies was also explored. Admittedly these are crude indices since they tell nothing about the distinction of such writing and other professional contributions. But they at least suggest what proportion of persons succeeded in getting some materials published and were elected or otherwise admitted to professional societies.

Thesis and Other Books or Monographs

Of the total sample, one in five (19.3 per cent) had published his dissertation as a whole, and another 34.9 per cent had published parts of it. About 46 per cent had published other books or monographs, with the median number (excluding the thesis) published by the whole group a little less than one (.97) per individual. Whereas larger percentages of the earlier graduates reported thesis publication (27.4 per cent published their whole thesis and another 46.1 per cent published part of it), a notably smaller per cent (10.5) had published other books and monographs.

By Types of Employment: Persons on university staffs published the most books (an average of 1.3 for persons so employed), and more had also published their entire thesis or some part of it. Those in government and public service ranked next, as judged by these forms of publication, whereas those who had joined college faculties (not part of universities) showed up the least well on these measures of research productivity.

By Major Fields: Publication of the thesis—in whole or part—did not vary significantly by major field, but there were important differences with respect to the publication of other books and monographs. Here those in Social Ecologies rank highest, with two-thirds of the candidates publishing other books or monographs (an average 1.7 per candidate). Candidates in Education ranked next, followed by those in the Humanities, Physiological Medicine, and Behavioral Sciences. The least productive, as judged by this particular criterion, were majors in the Chemical Sciences, with only .15 books reported per man and with less than 20 per cent involved in this type of publication. These figures unquestionably reflect differences in patterns of publication from field to field, as subsequent findings on the production of articles clearly shows. In general, those who majored in what Berelson (10) has termed the "word

disciplines" produce books earlier and in greater numbers than those in the "data disciplines."

By Preparation for Teaching: Interns were the least productive, as judged by thesis publication, being significantly exceeded by candidates with courses in higher education and some teaching experience and by those who had had no special preparation for teaching. However, in the publication of books other than the thesis, the interns (1.8 books per man) lead, followed by those who had other preparation for teaching. Candidates with no special preparation for teaching had published only .6 books per man, but since this group was composed predominantly of natural scientists, the low figures here may chiefly reflect the field of specialization.

Articles

The typical Ph.D. recipient of the mid-1950's had published 6.9 articles in the decade following his graduation. Over 87 per cent had published at least one, and 17 per cent had 22 or more to their credit. These figures are notably above those reported by Berelson (4), Buswell-McConnell (7), and several other investigators, suggesting that the Graduate School of Minnesota has succeeded well in encouraging this kind of scholarly activity.

By Types of Employment: The type of job held currently was significantly related to research productivity, as judged by this criterion. Those employed in government and public service and in universities were the most productive (with median figures of 9.5 and 9.3 articles respectively). Comparable figures for those in the other three types of employment ranged from 2.8 for those on college staffs to 3.9 for those in business and industry. Whether persons who join junior or baccalaureate college staffs have less opportunity, because of heavy teaching loads, to distinguish themselves in this respect, or whether persons without strong research interest gravitate to such positions cannot be answered by the present data. But the findings at least point up the marked concentration of productive researchers in universities and government agencies.

By Major Fields: Clinical Medicine majors, all of whom had published and two-thirds of whom had cited at least 22 articles to their credit, seemed extraordinarily productive. The next

ranking fields were Physiological Medicine (median of 17.5 articles), Biological Sciences (10.1), Agricultural Sciences (8.9), and Other Physical Sciences (7.6). Majors in Education and Humanities had published very few articles (medians of 3.7 and 3.5) during the decade investigated.

By Preparation for Teaching: Interns and candidates who elected higher education courses and also taught a college course before graduation published fewer articles (medians of 5.0 and 4.8 respectively) than those with only pre-graduation teaching experience or with no special preparation for teaching (medians of 7.2 and 7.7 articles respectively). There is some evidence here, then, to support the "teaching vs. research" feud, but because the subject fields and types of jobs involved also vary, it is difficult to draw any clear conclusions.

Membership and Offices Held in Professional Organizations

Minnesota doctoral recipients of the mid-1950's appear to be active in a great many national and international professional organizations. They belong to an average of 3.5 professional societies and many have held office in these associations (offices reported average .77 per man). Although the interns joined the post-graduate academic world at least a year later than their colleagues, they belong to as many professional societies. But they have held fewer offices (.39 per man) to date.

Movements In and Out of College Teaching[3]

Since most Minnesota Ph.D.s join or return to college or university staffs on receiving their degree, it seemed desirable to look into their motives for choosing the academic life, and, in the case of the small number who did so, why they subsequently left it for other types of employment. From persons currently engaged in teaching, which included some who had shifted to such positions after initial jobs elsewhere, information was sought about the number of credit hours and levels of students they are now teaching and about factors which may have contributed to their success and satisfaction in teaching.

[3]Used generically in this monograph, unless specifically compared with university teaching, to indicate teaching in all types of institutions of higher education.

Per Cent Presently Teaching in College

Almost two-thirds (63.3 per cent) of the study sample were currently engaged in college or university teaching. This figure is slightly below that reported for employment in these institutions, since some persons held exclusively research or administrative appointments.

By Types of Employment: Almost 92 per cent of those employed in colleges and 85 per cent of those employed in universities were currently doing some teaching. Surprisingly, 16 per cent of those who listed government and other public agencies as their employer and one per cent of those in business and industry also reported some college teaching. Although the questionnaire did not probe this point, it seems likely that this was on a part-time basis, perhaps involving participation in special university institutes or the supervision of interns.

By Major Fields: More than nine-tenths of the Ph.D.s in Humanities and Clinical Medicine reported that they were spending some time in teaching and for all but two of the ten major fields—Agricultural Sciences and Chemical Sciences—over 50 per cent of graduates were currently involved in some instructional activities (Table 8).

TABLE 8

PER CENT OF GRADUATES FROM VARIOUS MAJOR FIELDS CURRENTLY ENGAGED IN COLLEGE TEACHING

Field of Specialization	Per Cent Teaching
1. Agricultural Sciences	47.0
2. Biology and Related Agricultural Sciences	51.6
3. Education	81.7
4. Behavioral Sciences	60.7
5. Social Ecologies	82.7
6. Humanities	93.8
7. Physiological Medicine	70.0
8. Clinical Medicine	92.9
9. Chemical Sciences	34.2
10. Other Physical Sciences	50.6

By Preparation for Teaching: As an earlier comparison showed, all the former interns are employed in colleges and universities, in contrast to two out of three of other Ph.D.s. A noteworthy though by no means surprising finding is that the greater the preparation made in graduate school for teaching,

the higher the per cent of candidates currently so engaged. The interns, who had received the most extended training, show the highest per cent (93.3) presently teaching. About 81 per cent of candidates who had taken courses in higher education, and 75 per cent of those had done some pre-graduation teaching, are currently teaching, whereas only 41.1 per cent of those with no special preparation are doing so. Since persons who selected such training undoubtedly had a greater initial interest in college teaching careers, no causal relationship can be drawn. But whatever the complex of factors involved, special training received for teaching seems to confirm or deepen candidates' commitment to such service.

Number of Credit Hours and Types of Students Taught

For Minnesota Ph.D.s so engaged, the average teaching load is 7.2 credit hours per term, a figure that ranged from 3 credit hours (reported by 18.5 per cent) to 18 credit hours (reported by 4 per cent). About 87 per cent were teaching 12 hours or less and 50 per cent six or fewer credit hours.

According to estimates given of the composition of their classes, Minnesota Ph.D.s are mainly engaged in teaching upperclassmen and graduate students. Juniors and seniors typically constitute about 42 per cent and graduate students 30 per cent of their teaching load. Freshman and sophomore students, who constitute the bulk of the enrollment in most institutions, are in a decided minority in these professors' classes, which supports evidences from other studies regarding the "flight" of top-level faculty from lower division teaching.

Motives for Entering College Teaching

Presented with a list of twenty factors that may have influenced them to become college teachers, Ph.D.s who had taught at any time since graduation were asked to check those that had chiefly attracted them to this field. Intellectual challenge (selected by almost 60 per cent) was the most frequently cited motive; this also ranked first in specifications of the chief factor influencing the decision (see Table 9). The independence and flexible working conditions associated with faculty membership and the opportunities afforded for research were also judged highly influential (each cited by around 50 per cent). Other significant factors were the academic and social life of a campus, the feeling that more could be contributed to one's

TABLE 9

FACTORS INFLUENCING CHOICE OF TEACHING AS A CAREER

Factor or Motive	Per Cent Checking Item: (N=446)	A Factor	Chief Factor
1. Thought it would offer more intellectual challenge		59.6	14.1
2. Liked working conditions (independence, flexibility)		49.6	2.7
3. Wanted to pursue research activities		47.1	8.5
4. Wanted to be part of college academic and social life		45.5	1.8
5. Felt I could contribute more to society this way		44.6	11.4
6. Interest in subject		40.8	9.2
7. Felt I could contribute more to field this way		40.1	4.3
8. G.I. benefits enabled me to take advanced work		37.4	3.8
9. Graduate assistantship (internship) offered me		34.8	3.8
10. Desired to work with college-age students		34.5	2.2
11. College teacher recommended it		24.9	3.6
12. A college teaching job offered me		24.0	7.9
13. Wanted a job with security and prestige		19.8	.9
14. College administrator or counselor encouraged me		16.8	2.9
15. Desired to emulate a certain professor		14.6	1.6
16. Parent, friend, or relative favored this choice		14.1	1.1
17. "Drifted" into college teaching		13.2	1.6
18. High School staff suggested it		4.3	.2
19. Armed forces training led me into field		3.6	—
20. Husband (wife) was or planned to be college teacher		.7	—

own field and to society through such service, and interest which the major field had generated in sharing their knowledge with others. Only a fourth indicated that some college teacher had recommended this field to them, suggesting, as several earlier studies have, that faculty members in years past have done relatively little to recruit very able students to this career.

The "drift" factor seems to have been less influential than it appeared to be in the Gustad (19) and Eckert-Stecklein (15) studies of college teachers, for 11 of the 20 suggested motives outranked the statement "a college teaching job was offered me, although I had not sought it," cited by almost a fourth of the teachers. Only one respondent in eight (13.2 per cent) checked the statement "drifted into college teaching," which ranked 17th in the list. These are still sizeable proportions, though, suggesting that a good many graduate students do not make a deliberate, well-considered decision as to how they should invest their advanced training.

Motives for Leaving or Not Entering College Teaching

When asked why they are not presently teaching, those few graduates (7.5 per cent of the sample) who had taught in college for a while but had left it for another career and the much larger number (29.2 per cent) who had never taught pointed to a strange combination of money and altruism as their motives. Of those answering this question, a fifth (21 per cent) evidently wanted a job that paid better, almost 20 per cent felt they could contribute more to society through some other service, and 11 per cent wanted to do more research and writing than a teaching career usually permits. Less than 8 per cent endorsed each of the several other suggested factors.

Factors Thought to Contribute to Success and Satisfaction in Teaching

Although little is yet known about the factors which contribute to success and satisfaction in teaching, an effort was made to tap ideas on these points of Ph.D.s currently engaged in teaching. First they were asked to indicate experiences which may have contributed to this sense of fulfillment, and then to indicate whether they had found each of these to be "very profitable," "profitable," or "not profitable" in preparing them for college teaching. The results (see Table 10) show that these teachers had had a fairly wide range of relevant experiences. Topping the list, in terms of frequency of mention, were outstanding teachers in undergraduate and graduate classes and a strong program of graduate studies, each cited by four-fifths of those presently teaching. Two-thirds noted teaching assistantships and helpful teaching colleagues on their first jobs, whereas less than a fourth indicated any of the remaining factors. Ranking lowest was supervised teaching on their first college job (2.9 per cent), which suggests how infrequently new Ph.D.s obtain such help.

The best type of preparation for teaching, as indicated by "very profitable" ratings given by persons who had each experience, is to have had outstanding teachers either in undergraduate or graduate years (cited by 80.7 and 86.9 per cents respectively of these graduates). This obviously suggests the importance of distinguished models. A strong program of academic courses in the graduate school (cited by 78.3 per cent) also seems important. A teaching assistantship in graduate school and helpful fellow teachers at the initial employing

TABLE 10

TEACHERS' RATINGS OF EXPERIENCES THOUGHT TO CONTRIBUTE TO SUCCESS AND SATISFACTION IN TEACHING

Type of Experience	Per Cent Had Experience*	Checking Item Very Profitable	Rating Profitable
1. Outstanding teachers in graduate school	90.4	86.9	13.1
2. Outstanding teachers in undergraduate work	83.4	80.7	18.0
3. Strong program of academic courses in graduate school	82.1	78.3	20.9
4. Teaching assistantship in graduate school	68.7	69.1	25.7
5. Helpful fellow teachers at first job	69.4	61.9	36.5
6. Supervised teaching in first employing college	2.9	61.5	30.8
7. Supervised teaching in graduate school	20.8	56.0	33.2
8. Courses in higher education in graduate school	24.4	51.0	33.2
9. Supervised teaching in elementary or secondary schools	23.7	46.2	37.8
10. Faculty orientation program at first job	20.4	30.0	45.8

*The first column represents the per cent of all who **reacted** to the ten experiences (N=447); the second and third columns, per cents based on those who **had** the experience involved.

institution were also highly rated (69.1 and 61.9 per cents respectively). Supervised-teaching experiences in the graduate school and courses in higher education were likewise strongly endorsed by more than half of the participants. However, supervised-teaching experiences in the lower schools and faculty orientation programs in the initial employing institutions received less approval. Very few of the present teachers had these latter experiences, and only a third of those who did commended them strongly.

Identification with Teaching as a Career

Another pertinent question explored was whether persons who receive some type of preparation for teaching make earlier decisions than their colleagues to become college teachers, and whether, similarly, they identify earlier with the teaching profession and put a higher valuation on their instructional services.

Significant relationships were found for two of the three factors investigated. Persons who had prepared specifically for their teaching role claimed earlier identification with it and also rated themselves more highly than did other Ph.D.s currently engaged in teaching. Thus a higher per cent (53.3) of the interns than of those in other groups (around 40 per cent) had thought of themselves as teachers before or during their graduate studies; and 83 per cent of the interns, as compared with 70 per cent of all others, rated themselves as "excellent" or "very good" teachers. Those who had taken courses in higher education and had taught prior to graduation also felt more confident of their teaching ability than did the sample as a whole.

Summary

The present chapter has sketched the backgrounds and present experiences of selected Minnesota Ph.D. recipients, primarily to afford pertinent background for these graduates' evaluations of their doctoral programs, reported in the next chapter. Two-thirds of these graduates (66.6 per cent) were currently members of college and university faculties, and smaller proportions (15.3 and 12.7 per cents respectively) were employed by governmental agencies and industry. Relationships of some of the factors studied to graduate school major, nature of present employment, and preparation received for college teaching, which had been investigated by chi-square tests, yielded the following results:

Findings for Graduates Classified by Subject Fields

A higher proportion of majors in Education than in other fields had taught in elementary or secondary schools prior to graduation, and many more majors in Humanities, the Social Ecologies, and Education than other fields had held prior college teaching appointments. In Chemical Sciences and Clinical Medicine such appointments were rare.

Whereas all majors in Humanities and most majors in Education, Behavioral Sciences, and Social Ecologies are currently employed in colleges and universities, a majority of those in Chemical Sciences and a large per cent of those in Other Physical Sciences are working in business and industry. Governmental agencies had attracted many graduates in Agricultural, Biological, and Behavioral Sciences but few from other fields.

Two-thirds of those in Social Ecologies and half of those in Education, Behavioral Sciences, and Humanities had published books other than their thesis, in contrast to only a third of the candidates in the remaining fields. But the picture reversed for the median number of articles published in the past decade (6.9 for all fields), for here the figures ranged from four or less for typical Humanities, Education, and Social Ecologies majors to more than 17 for majors in Physiological and Clinical Medicine.

Findings for Graduates Classified According to Present Employment

Many more persons now on academic staffs than in other jobs reported pre-graduation teaching experiences. This was particularly characteristic of individuals who had joined undergraduate college staffs.

Minnesota graduates serving in universities generally publish more than their former colleagues, followed closely by those working for governmental agencies. Those teaching in undergraduate colleges did not show up well with respect to publication of the dissertations or subsequent articles, and those in business and industry were least productive in terms of books or monographs.

Although these graduates as a whole divide their work time almost equally between teaching, research, and administrative duties, persons employed in certain types of positions give greater emphasis to one or more of these functions. In college work it is teaching, in government it is research, in business it is administration, and in university work it is research and teaching.

Findings for Graduates Classified According to Preparation for Teaching

A significantly larger proportion of interns than of other Ph.D.s chose academic careers, are presently engaged in teaching activities, and feel confident regarding their teaching ability. These individuals were more likely than other graduates to affiliate with undergraduate colleges; and, although they lagged behind their classmates in thesis publication, they had a better record with respect to other types of books and monographs. Individuals who had taken some work in higher education also showed up more favorably than other groups on

measures related to interest in and satisfaction with teaching.

The present experiences of doctoral recipients are indeed diverse, with these differences at least partially related to their academic background. The next chapter will investigate graduates' reactions to the programs that prepared them for such varied experiences, while the concluding one will explore the possible significance of these findings for future programs of graduate study.

Chapter III

APPRAISALS AND RECOMMENDATIONS CONCERNING THE GRADUATE TRAINING

Minnesota's Ph.D.s of former years had become involved in a great variety of professional activities, affording them distinctive vantage points from which to evaluate their graduate school experiences. In both the earlier and recent follow-ups, an effort was therefore made to tap their current thinking regarding many commonly-stated goals of doctoral studies and certain issues related thereto. Appraisals were likewise sought of graduate school courses, teachers, and the Ph.D. experience as a whole. The resulting data were analyzed to see whether opinions varied according to training patterns or current type of employment, and whether more recent Ph.D.s felt differently on some of these points than did persons granted doctorates in the 1935-48 period.

Reactions to Suggested Goals of Graduate Education

A "Committee of Fifteen," comprised of graduate school deans, who had reviewed the Ph.D. program in 1955, echoed the judgments of many others who have looked closely at American doctoral programs when it concluded that "we have never clearly defined this protean degree" (32). Although conceived initially as an award for outstanding scholarship demonstrated in an original contribution to learning, it has also, almost from the start, served as a practitioner's degree, and notably so for persons who later join college and university staffs. Current controversies as to the relative weight to be given to "pure" scholarship and to the development of various types of applied skill and knowledge have a long and stormy history. Hence it was not possible in the present study to use some generally accepted definition of the purpose of the Ph.D. degree as a guide in outlining present or proposed goals of such training. And to express such objectives, once identified, in terms of desired knowledge, skills, or attitudes, posed great difficulties. But at the time the first study was undertaken, the staff of the Bureau of Institutional Research at Minnesota, after

reviewing the literature and conferring with knowledgeable people locally, formulated thirty-five such goals, expressed as far as possible in behavioral terms. This list was reduced to thirty for the recent study by eliminating a few goals that seemed not as pertinent now as earlier. Although some wordings might have been refined, the original form was retained to permit comparisons for the two periods involved. Participants in both studies were asked to react to each statement in two ways—first by indicating how essential the ability involved was in their current work and then by noting whether it had been acquired or developed through their graduate studies.

Figures ranging from as few as 6 per cent to as many as 76 per cent who judged specific skills essential in their present work suggest the wide diversity of professional demands these graduates face. Equally impressive are differences, reflected by percentages ranging from 8 to 88, in the perceived emphasis given these goals in graduate training. But there was no close relationship between the two sets of judgments, for certain "essential" skills had apparently received little attention, and vice versa.

Appraisals given by the 1954-56 Ph.D.s[1] will be reported under five major headings, namely goals pertaining to (1) professional development, (2) administration, (3) teaching, (4) research, and (5) general education. Some appraisal of the Graduate School's effort will be given at the close of each section, using for this purpose an index figure which relates the per cent of the sample at large who judged each of the specified skills necessary to the per cent who judged it attained during graduate years. If about as many graduates judged a goal "attained" as had rated it "essential," reasonable satisfaction with the Graduate School's effort may be inferred. But if the figures differ widely in either direction, the situation would seem to merit careful study.

Of the thirty goals suggested, the fifteen that all graduates of these years judged to be most useful presently are noted in bold type in the accompanying tables. For these particular items, which apparently loom large in Ph.D.s' current professional responsibilities, special analyses were made to find out whether judgments of usefulness differed significantly according to the types of employment. Similarly, responses related to

[1] Detailed analyses are limited to these persons, with a concluding section exploring the general consistency of their responses with those obtained from the 1935-48 Ph.D.s.

attainment of these important goals were studied by major field and preparation received for teaching, to see if pre-graduation experiences may have been a significant factor here. The section concludes with a comparison of the 1935-48 and 1954-56 Ph.D.s' judgments on these points.

Abilities Related to Professional Development

Although all thirty goals are broadly pointed toward professional growth and development, six were put in this category, mainly because they did not fit the more specific classifications given later. Findings presented in Table 11 indicate, as similar subsequent tables will do, the per cent of the 1954-56 Ph.D.s who judged the specified ability as "essential" in their present work and likewise the per cent who thought that it had been "acquired" in graduate school.

TABLE 11

ABILITIES RELATED TO PROFESSIONAL DEVELOPMENT JUDGED "ESSENTIAL" PRESENTLY AND "ACQUIRED" IN GRADUATE SCHOOL

Abilities Related to Professional Development	Per Cent Essential	Per Cent Acquired
1. **A thorough understanding of major graduate field**	72.4	83.3
2. **Acquaintance with professional journals**	57.5	81.3
3. Knowledge in a minor field	47.2	87.5
4. Ability to serve as consultant in field	30.9	44.7
5. Skill in interpreting and using standardized tests	17.6	35.0
6. Reading knowledge of foreign languages	6.0	50.2

Usefulness of These Goals: One of these goals, "a thorough understanding of major graduate field" (the third most "essential" goal in the entire list) was judged so by three-fourths of all respondents. "Acquaintance with professional journals in field" and "knowledge in a minor field" ranked 13th and 16th respectively in the 30 ratings made on this point. But the remaining three were in the bottom third of goals judged necessary by Ph.D. recipients in their present work.

Persons in five types of employment differ significantly only with respect to the judged utility of "acquaintance with professional journals in field." Whereas four-fifths of university staff members claimed this was "essential," only half of those in other positions gave this high a rating.

Attainment of These Goals: A comparatively large number of Ph.D. recipients seemingly achieved these six goals, with more than four-fifths giving affirmative answers on the first three listed. When the thirty suggested goals are ranked according to their judged attainment, all six of these goals are in the top two-thirds and all but one, "skill in interpreting and using standardized tests," among the top fifteen.

Graduates from various major departments and teacher-preparation programs were compared on the attainment of the first two goals appearing in Table 11 (since these were among the fifteen most useful as rated by all graduates). Although type of graduate school major was not related to their judged attainment, the kind of preparation afforded for teaching was with respect to the second item, "acquaintance with professional journals in field." The interns felt more confident than did other Ph.D.s that they had acquired this particular skill, suggesting that they had not neglected other important aspects of professional development in their quest of teaching skills.

Appraisal of Graduate School Emphasis: All the specified goals pertaining to professional development seemed to have been emphasized in the Graduate School, with the greatest stress expectedly given to acquiring sound knowledge in the major and minor fields and learning about professional journals. But "knowledge in a minor field" and "reading knowledge of foreign languages" were apparently emphasized more than these Ph.D.s judged necessary, for over 40 per cent of those who acquired these abilities saw little direct use for them in their present work.

Administrative and Professional Relationships

Since most graduates join academic institutions or other organizations where they must work with other persons on problems beyond their own teaching and research, seven items were oriented primarily to these administrative or colleague-student relationships (see Table 12).

Usefulness of These Goals: The first three of the goals given in Table 12, which two-thirds or more of these Ph.D.s judged as "essential" in their present work, chiefly involve skills and attitudes required in successful cooperative endeavor. Approximately half also cited abilities involved in appraising professional contributions and in delegating responsibilities. The

TABLE 12

ADMINISTRATIVE ABILITIES AND INTERPERSONAL SKILLS JUDGED "ESSENTIAL" PRESENTLY AND "ACQUIRED" IN GRADUATE SCHOOL

Administrative and Professional Relationships	Per Cent Essential	Per Cent Acquired
1. **Sense of professional obligation and ethics**	70.4	46.5
2. **Ability to organize and present ideas to colleagues**	68.6	50.7
3. **Ability to work with others in a professional endeavor**	68.2	43.0
4. **Ability to appraise professional contributions**	50.7	64.6
5. Skill in delegating work or responsibility	44.3	9.9
6. Skill in advising students	33.0	26.6
7. Ability to work with students in extra-class relationships	11.6	8.5

remaining two items pertaining to student relationships were deemed much less important.

Graduates in five types of employment differed significantly in their judgments on only one of the abilities canvassed. Whereas three-fourths of those on college and university faculties considered a "sense of professional obligation and ethics" as essential, only half of those in business and industry expressed this view.

Acquisition of These Goals: From 43 to 65 per cent of the respondents judged that they had attained four of the goals canvassed. These four, involving the "ability to appraise professional contributions of others," the "ability to organize and present ideas to colleagues," a "sense of professional obligation or ethics," and the "ability to work with others in a professional endeavor," ranked in the top half of the thirty goals on the basis of judged emphasis in graduate training. In contrast, relatively few of these Ph.D.s thought that their graduate work had contributed to the three remaining goals.

Only a third (37.0 per cent) of the majors in Physical Sciences felt that they had acquired the "ability to appraise professional contributions of others," as compared with from 50 to 69 per cent of the majors in the other nine fields. But no significant differences among major groups appeared on the other items studied.

Type of preparation afforded for college teaching was similarly unrelated to judged acquisition of most of these skills. However, the interns and those with courses in higher educa-

tion were more confident than other graduates that they had gained a "sense of professional obligation and ethics." And a much higher proportion of interns (82 per cent) than of those in all other groups (where percentages ranged from 43 to 60 per cent) judged they had acquired the "ability to organize and present ideas to colleagues." Again the internship experience, with its sharp focus on teaching, did not result in any observable neglect of other skills; and on some, such as the foregoing, which may have distinct classroom value, the interns actually hold some advantage.

Appraisal of Graduate School Emphasis: These goals were typically not stressed as much in graduate training as these Ph.D.s' present evaluations of their importance might have justified. The largest disparities, involving differences of about 25 per cent, occurred on items relating to a sense of professional ethics, ability to work well with others in professional endeavors, and skill in delegating work. Only one, "ability to appraise professional contributions of others," was thought to have been "acquired" by more than had judged it "essential." Both the "essential" and "acquired" ratings were very low for "ability to work with students in extra-class relationships."

Abilities Related to Research

The cultivation of scholarly skills and abilities has always been a widely accepted goal of advanced graduate studies. As Moody Prior (30) recently observed, "The Ph.D. has been protean with respect to the diversity of fields of study; it has been reasonably consistent in its approach to these . . . namely the cultivation of the learned scholar." Five items focusing on the research and creative scholarship of other types were therefore included in the present survey.

Usefulness of These Goals: The sample at large found "familiarity with research materials and methods" to be the most necessary of all thirty goals investigated (see Table 13). Also ranking in the top half of all thirty goals were the two items on skill in conducting research and doing other creative work.

Those holding different types of positions disagreed substantially on the utility of the three most highly rated research abilities. Thus those now working in universities or business and industry saw much more need for these particular skills

TABLE 13

RESEARCH ABILITIES JUDGED "ESSENTIAL" PRESENTLY AND "ACQUIRED" IN GRADUATE SCHOOL

Abilities Related to Research	Per Cent Essential	Per Cent Acquired
1. **Familiarity with research materials and methods**	76.3	88.0
2. **Skill and practice in doing research**	62.3	86.2
3. **Ability to do research, produce artistic creations**	59.2	81.3
4. Ability to supervise research programs	46.5	41.5
5. Ability to use a wide range of library resources	43.6	70.7

than did those affiliated with undergraduate colleges or government agencies.

Acquisition of These Goals: A decisive majority of Ph.D.s, ranging from 71 to 88 per cent, felt that they had attained the abilities specified in four of these five research goals. Although this percentage dropped to 41 in the case of the "ability to supervise research programs," the item still ranked above the median in terms of judged attainment. Neither graduate school major nor type of preparation afforded for teaching were related to judgments on these points, which is not surprising in view of the high research expectations set for practically all Ph.D. candidates.

Appraisal of Graduate School Emphasis: The graduate school gave strong emphasis to research training, and quite appropriately so since three of the five goals involved ranked in the top fifteen with respect to judged usefulness. But it is also interesting to note that considerably more Ph.D.s judged that they had "acquired" four of the listed skills than had rated them "essential" in their present work. For the remaining goal, involving "ability to supervise research programs," slightly fewer Ph.D.s judged it acquired than had rated it essential.

Abilities Related to Teaching

Since the most common criticisms of Ph.D. programs center around presumed lack of attention to teaching skills and abilities, seven items relating to these were included in the inventory. Analyses based on graduate school preparation promised to be particularly interesting, since teaching had been stressed much more in some programs than in others.

Usefulness of These Goals: Five of the seven goals listed in Table 14 rated in the top fifteen in terms of estimated value on present jobs. The two found to be particularly necessary to the sample at large were "skill in lecturing" and "ability to outline objectives and organize courses," which ranked 2nd and 4th respectively among the 30 goals.

TABLE 14

TEACHING SKILLS JUDGED "ESSENTIAL" PRESENTLY AND "ACQUIRED" IN GRADUATE SCHOOL

Abilities Related to Teaching	Per Cent Essential	Per Cent Acquired
1. **Skill in lecturing**	72.9	27.7
2. **Ability to outline objectives and organize courses**	71.7	40.0
3. **Ability to teach or train others**	60.7	35.4
4. **Skill in handling discussions**	60.5	30.4
5. **Skill in planning for effective use of limited time**	58.9	27.0
6. Ability to direct students in use of library	29.7	42.4
7. Skill in making and using illustrative devices	20.8	22.8

Whatever these individuals' present employment, they agreed substantially on the importance of these teaching skills. Only one significant difference emerged, involving "skill in handling discussions," which was more highly valued by persons in academic life than in other positions. Faculty members in undergraduate colleges were especially convinced of its importance.

Acquisition of These Goals: Although Ph.D.s rated most of these as "essential" skills, they did not feel very confident that they had acquired them in their graduate training. Only two-fifths (42.4 per cent) thought they had acquired the "ability to direct students in the use of the library," and the other six goals ranked even lower. Only one Ph.D. in four, for example, thought that he had achieved skill during his graduate school years in lecturing or in planning to use limited time effectively.

The department in which the individual majored bore some relationship to judged attainment of four of the most useful teaching skills. Those majoring in Medicine, Education, and Humanities were generally more confident that they had gained these abilities than were majors in Behavioral Sciences, Social Ecologies, and Chemical or Agricultural Sciences.

When former interns were compared with their classmates, significant differences also emerged on the first four of the five top-ranking teaching skills, with the interns expressing more confidence than other groups that they had acquired these during their graduate training. Those who had had courses in higher education or some pre-graduation experiences in teaching also outranked those lacking such preparation, particularly with respect to "ability to outline objectives and organize courses."

Appraisal of Graduate School Emphasis: Five of the seven skills pertaining to teaching were given considerably less stress in the graduate school than Ph.D. recipients' ratings of their usefulness would have suggested. Although these five ranked in the top fifteen in terms of current usefulness, they were all in the bottom half in terms of judged acquisition. As an example, "skill in lecturing" was rated "essential" by 73 per cent of Ph.D. recipients but judged "acquired" by 28 per cent. Only on the remaining two—"skill in using and making illustrative devices" and "ability to direct others in the use of the library" —which were much less commonly used—did more persons judge them "acquired" than had rated them "essential."

Abilities and Knowledge Related to General Education

Although graduate schools typically assume that general or liberal education has been adequately provided for in baccalaureate programs, many recent writers (3, 8, 11, 25, 26, 33) stress the need for cultivating such breadth of outlook in both graduate and continuing education. Five items were included in the present inventory to see how former students valued abilities commonly associated with general education.

Usefulness of These Goals: The value of a liberal education must be assessed on several bases and perhaps least adequately so in terms of its "usefulness" in present employment. But as Table 15 indicates, more than half (54 per cent) of these graduates thought that "possession of a satisfying philosophy of life" was "essential" in their work, with highest endorsement given this goal by persons teaching in undergraduate colleges. The number of graduates who thought the other listed abilities highly important was considerably smaller, ranging from 15 to 36 per cent. But most of the remaining individuals chose the second step ("valuable"), indicating that they had found some use for these abilities in their professional work.

TABLE 15

GENERAL EDUCATION ABILITIES JUDGED "ESSENTIAL" PRESENTLY AND "ACQUIRED" IN THE GRADUATE SCHOOL

Abilities and Knowledges Related to General Education	Per Cent Essential	Per Cent Acquired
1. **Possession of a satisfying philosophy of life**	53.5	12.4
2. Command of a broad field (major included)	36.3	30.6
3. Knowledge in a collateral field	24.1	38.8
4. Knowledge of public affairs	21.4	7.5
5. Broad knowledge of American college	15.2	21.0

Acquisition of These Goals: Objectives pertaining to general education had apparently been the least emphasized of the five clusters of goals investigated. Only 7 per cent of these Ph.D.s, for example, felt that their graduate school experiences had promoted their knowledge of public affairs, while 39 per cent claimed this for "knowledge of a collateral field," which was the highest rated goal of this cluster.

Since only one, "possession of a satisfying philosophy of life," ranked in the top half in terms of judged usefulness, comparisons by different major fields and training programs were restricted to this single item. Majors in Agricultural Sciences and Education appeared to be the most confident and those in Physiological Medicine and Physical Sciences the least so regarding its acquisition. Rather surprisingly, Humanities majors, whose fields of specialization relate directly to the study of man's values and aspirations, were outranked by four other groups on this criterion. No differences were found on this point among groups classified according to their preparation for teaching.

Appraisal of Graduate School Emphasis: These goals had evidently received little attention during graduate training, and in the case of two—"possession of a satisfying philosophy of life" and "knowledge of public affairs"—had been given much less emphasis than Ph.D.s' future work responsibilities might have argued. A third—"command of a broad field of knowledge, including major"—was also rated necessary by more than had judged it "acquired," though the difference in this instance was small. But all judgments here must be tempered by the fact that such education is primarily aimed not at greater job proficiency but the development of mature, enlightened persons.

Appraisals from the 1935-48 Study

The earlier study did not include comparisons of persons in various types of employment or of those with different types of preparation for teaching. For those based on graduate school major, much the same picture regarding acquisition of the suggested goals emerged as in the recent study. In both periods Clinical Medicine majors thought they had acquired the largest percentage of these goals, and Education majors felt especially confident about teaching goals.

Usefulness of These Goals: There is remarkable similarity in the judgments that recent respondents and those in the earlier study made regarding the importance of the thirty

TABLE 16

SUGGESTED GOALS OF GRADUATE EDUCATION ENDORSED AS "ESSENTIAL" AND "ACQUIRED" IN THE 1935-48 AND 1954-56 STUDIES OF DOCTORAL RECIPIENTS

Graduate School Goals	*The 1935-1948 Study**		*The 1954-1956 Study**	
	Per Cent Essential	Per Cent Acquired	Per Cent Essential	Per Cent Acquired
1. Familiarity with research materials and methods	70.8	69.4	76.3	88.0
2. Skill in lecturing	62.8	12.0	72.9	27.7
3. A thorough understanding of major graduate field	84.2	80.1	72.4	83.3
4. Ability to outline objectives and organize courses	79.9	19.4	71.7	40.0
5. Sense of professional obligation and ethics	69.6	28.6	70.4	46.5
6. Ability to organize and present ideas to colleagues	67.7	32.7	68.6	50.7
7. Ability to work with others in a professional endeavor	76.9	21.8	68.2	43.0
8. Skill and practice in doing research	43.4	74.9	62.3	86.2
9. Ability to teach or train others	58.6	27.9	60.7	35.4
10. Skill in handling discussions	43.3	17.1	60.5	30.4
11. Ability to do research, or produce artistic creations	64.1	65.2	59.2	81.3
12. Skill in planning for effective use of a limited time	63.1	11.7	58.9	27.0
13. Acquaintance with professional journals in field	70.2	65.8	57.5	81.3
14. Possession of satisfying philosophy of life	53.2	9.6	53.5	12.4

TABLE 16 (continued)

Graduate School Goals	*The 1935-1948 Study** Per Cent Essential	*The 1935-1948 Study** Per Cent Acquired	*The 1954-1956 Study** Per Cent Essential	*The 1954-1956 Study** Per Cent Acquired
15. Ability to appraise professional contributions	52.5	44.6	50.7	64.6
16. Knowledge in a minor field	45.5	71.1	47.2	87.5
17. Ability to supervise research programs	49.1	32.3	46.5	41.5
18. Skill in delegating work or responsibility	45.7	7.2	44.3	9.9
19. Ability to use a wide range of library resources	52.4	60.8	43.6	70.7
20. Command of a broad field of knowledge including major	33.2	17.8	36.3	30.6
21. Skill in advising students on all types of problems	26.1	21.2	33.0	26.6
22. Ability to serve as consultant in field	40.4	29.1	30.9	44.7
23. Ability to direct students in use of library	45.7	29.3	29.7	42.4
24. Knowledge in a collateral field	26.0	10.8	24.1	38.8
25. Knowledge in public affairs	20.0	3.3	21.4	7.5
26. Skill in making charts, models, slides, etc.	23.9	11.6	20.8	22.8
27. Skill in interpreting and using standardized tests	15.1	24.2	17.6	35.0
28. Broad knowledge of American college (purpose and problems)	13.0	8.1	15.2	21.0
29. Ability to work with students outside of class	9.2	3.9	11.6	8.5
30. Reading knowledge of foreign languages	7.8	43.6	6.0	50.2

*The number of cases for the 1954-56 study was 600 and the 1935-48 study 1,139.

listed goals, as this might be inferred from estimated values in current jobs. As Table 16 shows, these graduates, inventoried fifteen years apart, gave almost identical ratings on most points. On 18 of the 30 items included, the percentages indicating these as "essential" skills or abilities in their work varied less than five per cent, or within what might be chance fluctuations in samples of this size.[2] Items that were rated low in the earlier study generally remained so in the later evaluations, and this was also true of most of those identified as of major

[2] All differences in percentages were tested statistically, with those cited in the text significant at the .05 level and practically all of these latter at the .01 level.

significance ("essential"). Although a few items moved up or down in these two sets of evaluations, the median figure for the thirty percentages involved remained identical (49.1 for the 1935-48 graduates and 49.0 for the 1954-56 graduates).

On the twelve items showing differences of five per cent or more, seven indicated more use of the specified abilities by earlier graduates, whereas five pointed in the opposite direction. Differences of more substantial size (exceeding 15 per cent) occurred on only three items, with more respondents in the earlier than in the later study stressing "ability to direct students in the use of the library," and more of the recent than the earlier graduates emphasizing "skill and practice in doing research" and "skill in handling discussions" as essential in their current professional activities. No clear pattern could be discerned in these differences, so that the largest impression gained is that of similarity in the job demands faced by Ph.D.s of the two periods studied.

Acquisition of These Goals: Contrasting sharply with the general stability of ratings on job demands were appraisals of the graduate school's contributions to attainment of these abilities, skills, and outlooks. Here quite a different picture emerges, with the median percentage, based on "acquired" responses given to all 30 items, advancing from 27.9 per cent in 1950 to 40.8 in 1965. In other words, recent graduates were more convinced than the earlier ones that their graduate education had contributed to a good many of these goals. On only six of the 30 items were differences of less than five per cent found, and what is more significant, responses on the 24 other items consistently favored the training given in more recent years.

The nine largest differences (exceeding 15 per cent) suggest that the graduate school has strengthened its program in several directions. Two of the items concerned research training, but more notable were the advances reflected in preparation for teaching and other professional roles. Although important gaps still remained, as the earlier discussion clearly shows, between perceived work demands and the training obtained for such responsibilities, these were neither as pronounced nor as numerous as those revealed in the earlier study. In 1950, for example, the gap between the "essential" and "acquired" figures exceeded 30 per cent on eleven items, but by 1965 this latter figure had dropped to six. In both instances the failure to prepare candidates for certain oncoming tasks, particularly for teaching, was scored most often. But it is clear that in the

interval the Graduate School had made substantial progress in these directions.

Views on Controversial Issues in Graduate Education

All Ph.D.s in the recent study were asked to indicate whether they agreed, disagreed, or were uncertain regarding the value of ten proposals currently debated in graduate circles. Having tested their training for a decade in the post-graduate world, these people might be expected to have informed opinions about how much specialized study, research training, general education, and specific preparation for teaching should be included in Ph.D. programs. Reactions of all graduates to the ten selected issues are given in Table 17.

Reactions to four of these proposals indicate that a great many of these Ph.D.s would prefer more breadth in course work and thesis topics. Thus over 80 per cent favored exploring relationships among various fields of knowledge through interdisciplinary seminars. With probably similar intent, half would like to substitute courses in two or three non-major fields for the traditional minor. Two-fifths favored dissertations that analyze, integrate, and interpret existing knowledge and placing more stress in graduate education on the cultivation of broad understandings and wisdom, as contrasted with techniques and skills.

About the same proportions (42 and 44 per cents respectively) thought that the Ph.D. program should require less time (three years for course work and thesis) and that the dissertation should be viewed as a "trial run" rather than a "major contribution" to knowledge. But only a fourth would be willing to have three or four research-based articles substitute for the dissertation or saw any pressing need for further integration of undergraduate and graduate studies or for modifying the format of the dissertation or final oral.

Probably the most striking finding emerging from this analysis was the high endorsement given the proposal that doctoral candidates expecting to join college or university faculties receive more training for teaching while in the graduate school. This ranked second in the entire list, with 61 per cent endorsing it, another 18 per cent expressing uncertainty, and 20 per cent opposed to such a plan.

Some intriguing differences emerged when views on these points were related to both graduate school major and type of

present employment. In general, candidates in Education and the Behavioral and Biological Sciences endorse the teacher education function more strongly than candidates in most other fields. Rather curiously, majors in the Humanities gave the least support to this proposal, despite the fact that practically all had entered teaching careers. However, even in this field and in every type of non-academic employment, one out of two

TABLE 17

GRADUATES' REACTIONS TO TEN CURRENT PROPOSALS IN GRADUATE EDUCATION

Proposal	Per Cent Agree	Uncertain	Disagree
1. Graduate students should be encouraged to substitute courses in two or three non-major fields for the traditional minor	47.7	23.7	28.6
2. Doctoral programs should stress broad understanding, cultivation, and wisdom rather than techniques and skills	42.2	25.9	31.9
3. Doctoral candidates preparing for college teaching should get more training in teaching while in graduate school	60.8	18.5	20.6
4. Interdisciplinary graduate seminars should be established to explore relationships among various fields of knowledge	81.7	12.7	5.6
5. More doctoral dissertations should be of the type that analyze, integrate, and interpret existing knowledge	41.1	28.7	30.2
6. Graduate work should be more closely related to undergraduate work, making for better sequence in learning	22.7	37.9	39.4
7. Most graduate students should be able to finish the Ph.D. in a short period, e.g., three years for course work and thesis	42.3	25.5	32.2
8. The dissertation should be viewed as a "trial run" in which candidates learn research procedures rather than as a "major contribution"	45.2	19.9	34.9
9. The publication of three or four research-based articles in a scholarly journal should substitute for the dissertation	25.7	24.9	49.4
10. A public defense or two or three lectures on the dissertation topic should substitute for the final oral examination	27.1	30.4	42.5

recommended that the graduate school give more attention to the cultivation of scholar-teachers. Majors in the Behavioral and Chemical Sciences and those employed in business and industry saw less need than other graduates for breadth in course work and thesis topics.

Graduates of the 1935-1948 period expressed much the same views as more recent Ph.D.s on these issues. By decisive majority, they, too, favored more emphasis on teacher education during graduate years. But they saw relatively more value in the traditional minor and less in breadth of preparation and general education than did those of the mid-1950's.

Appraisals of Graduate School Courses, Teachers, and Entire Ph.D. Experience

Over 90 per cent of the 1954-56 Ph.D.s thought they had had outstanding graduate school teachers, and more than 82 per cent attested to a strong program of academic courses. Whereas all majors in Clinical Medicine and Humanities and practically all in certain other fields thought their teachers had been outstanding, more than a fourth of those in Chemical Sciences seemingly had reservations on this score (see Table 18). But majors in the Social Ecologies, Chemical Sciences, and Humanities seemed more pleased with their courses than did those in Education, Behavioral Sciences, and Physiological Medicine.

A comparison of the two columns of Table 18 reveals something of an anomaly. Whereas the lowest per cent of candidates

TABLE 18

APPRAISALS BY GRADUATES IN TEN FIELDS OF THEIR TEACHERS AND COURSES

	Per Cent Reporting Teachers	Outstanding Courses
1. Agricultural Sciences	83.8	81.1
2. Biology & Related Agricultural Sciences	85.3	82.4
3. Education	96.2	66.0
4. Behavioral Sciences	88.7	78.4
5. Social Ecologies	97.4	98.7
6. Humanities	100.0	87.5
7. Physiological Medicine	90.6	78.1
8. Clinical Medicine	100.0	80.1
9. Chemical Sciences	73.7	94.7
10. Other Physical Sciences	83.6	80.0

in the Chemical Sciences reported outstanding teachers, this group ranked second highest in estimates of the strength of their courses. Just the opposite pattern emerged for Education majors, who ranked their teachers very high but gave a relatively low rating to the courses involved. The prefacing word "academic" may have kept some Education and Physiological and Clinical Medicine majors from including their "professional" courses in this category, for their course appraisals fell well below other ratings given graduate experiences.

The final judgment sought related to these Ph.D.s' satisfaction with their graduate school experiences as a whole. Given a choice of five degrees of satisfaction, ranging from "thoroughly satisfied" to "very dissatisfied," the 1954-56 graduates expressed judgments that must be very gratifying to the University. Roughly three-fifths (58.5 per cent) expressed themselves as "thoroughly" or "very satisfied," and another 30.6 per cent indicated that they are "satisfied" (see Table 19). Less than 10 per cent expressed some dissatisfaction, with this acute for only one graduate in a hundred.

Type of present employment was not related to these Ph.D.s' satisfaction, but graduate school major and type of preparation for teaching were. Education majors were the most satisfied, with 71.7 per cent characterizing themselves as "thoroughly" or "very satisfied." Other groups ranking high on this point included majors in Medicine, Behavioral Sciences, Social Ecologies, and Agricultural Sciences. Majors in Biological and Physical Sciences expressed relatively less satisfaction, though only one in eight of Ph.D.s in these fields actually said he was dissatisfied. About three-fourths of the interns and those who had taken courses in higher education expressed strong satisfaction with their graduate programs, in comparison with 55 per cent of those with only pre-graduate teaching or no experiences or special preparation for college teaching. But again the most noteworthy finding seems to be the substantial endorsement which all groups gave to their graduate studies.

Summary

This chapter has probed Minnesota Ph.D.s' judged acquisition and use of abilities commonly associated with or proposed for doctoral training. Also reported were their views on selected controversial issues in graduate education and their appraisals of their teachers, courses, and total degree program.

TABLE 19

SATISFACTION WITH GRADUATE SCHOOL BY MAJOR FIELDS AND TEACHER-PREPARATION GROUPS

Type of Group	Per Cent Checking Item: Thoroughly Satisfied	Very Satisfied	Satisfied	Somewhat Dissatisfied	Very Dissatisfied
A. TOTAL SAMPLE	22.6	36.2	30.6	8.3	1.3
B. MAJOR FIELD					
1. Agricultural Sciences	22.4	35.8	31.3	10.5	0.0
2. Biology & Related Agricultural Sciences	24.2	22.6	37.1	12.9	3.2
3. Education	36.7	35.0	23.3	3.3	1.7
4. Behavioral Sciences	26.3	34.2	28.1	9.7	.9
5. Social Ecologies	21.7	45.8	21.7	8.4	1.2
6. Humanities	9.4	53.1	34.4	0.0	0.0
7. Physiological Medicine	18.6	44.2	27.9	7.0	2.3
8. Clinical Medicine	25.7	46.0	21.4	7.1	0.0
9. Chemical Sciences	14.0	39.5	39.5	4.7	0.0
10. Other Physical Sciences	16.1	29.6	39.5	11.1	2.5
C. TYPE OF PREPARATION FOR TEACHING					
1. Interns	26.7	50.0	10.0	13.3	0.0
2. Those with higher education courses and teaching experience	32.9	39.2	24.1	2.5	1.3
3. Those with higher education courses	32.0	44.0	20.0	0.0	4.0
4. Those with pre-graduation teaching	19.6	34.4	33.0	10.7	1.3
5. Those with no teaching preparation	20.3	34.4	34.0	8.3	1.2

On the whole, these Ph.D. recipients are very satisfied with their graduate school experiences and give high endorsement to their doctoral courses and teachers. However, they believe the emphasis given to many graduate school goals concerned with research and professional development exceeded their present usefulness and suggest increased attention to general education goals and considerably more stress on developing administrative and teaching skills. In expressing their stand on controversial issues on graduate education, they again strongly endorse more preparation for teaching and favor more breadth in course work and thesis topics. Two-fifths also advocate a lessening of the time it takes to complete the degree.

Relationships between responses on these items and major field, present type of employment, and preparation for teaching

were examined, with significant findings reported below. Comparisons of the views of the 1935-48 and 1954-56 Ph.D.s on practices and issues in graduate education conclude this summary.

Graduates Classified According to Subject Field

Majors in some fields were much more optimistic than those in others regarding their attainment of certain goals of graduate education. On half of the fifteen goals most frequently recognized as "essential" by candidates as a whole, significant differences in judged attainment appear, generally favoring majors in Clinical Medicine, Education, Social Ecologies, and Humanities. These differences were most marked regarding skills pertaining to teaching and general education. Most candidates in the first three fields were also very confident that they had gained research skills and, in the case of the first two, skills related to administration and professional development.

The field of specialization was likewise related to graduates' endorsement of certain proposals relating to Ph.D. programs. Thus, majors in the Behavioral and Chemical Sciences saw less need than those in other fields for breadth in course work and dissertation topics, and majors in Education and the Biological Sciences favored some teacher education during graduate years even more strongly than did their colleagues in other disciplines.

Graduates in different fields also varied somewhat in their appraisals of their graduate school teachers and courses and their general satisfaction with their advanced training, though differences on these points were less marked than on those noted above. Specialists in the Social Ecologies, Chemical Sciences, and Humanities gave strongest endorsement to their graduate school courses, whereas those in Clinical Medicine, Humanities, and Education expressed greatest satisfaction with both their graduate professors and their doctoral program as a whole.

Graduates Classified According to Present Employment

Persons employed in universities saw more need than their colleagues in other fields, notably those in undergraduate colleges, for certain of the research skills explored. But regardless of their present type of job, these Ph.D.s agreed closely on the usefulness of most of the other suggested graduate school experiences (including, surprisingly, those aimed at developing

teaching skills) and they took a similar stand on most issues in graduate education. They likewise appeared to be equally satisfied with the total program.

Graduates Classified According to Preparation for Teaching

Although similarities in view among persons with different training patterns are more impressive than differences, a few significant relationships between preparation and current outlooks emerged.

Persons who had held teaching internships expressed more confidence than other graduates that they had acquired four of five specified skills pertaining to teaching. Even in the fifth case, where chance differences could not be precluded, the interns outranked the other groups.

Interns were similar to other Ph.D.s on most of the remaining skills canvassed, with only three showing significant differences, in each case favoring the interns. Hence it did not appear that interns had neglected their development of research and other professional skills in order to gain proficiency in teaching.

Interns and other candidates with special preparation for teaching (those who had taken courses in higher education and also held a full-time teaching job prior to graduation) expressed greater satisfaction with their graduate school experiences than did persons without this special orientation.

Graduates Classified According to Time of Doctoral Studies

Comparisons of earlier (1935-48) and later (1954-56) Ph.D.s in terms of perceived values of various aspects of their graduate training revealed some important differences. Whereas both groups expressed very similar judgments as to the particular types of knowledge, skill, and other abilities required in their current jobs, persons prepared in the mid-1950's were more confident that their graduate training had prepared them for their present responsibilities. As the preceding analyses have shown, impressive gaps still remain between judged acquisition of certain abilities (and notably so with respect to teaching skills) and perceived job demands, but these were neither as large nor as numerous for the more recent graduates. Opportunities for gaining the needed competencies had increased in the intervening years, but there is clearly room for further improvement.

Chapter IV

DESCRIPTIONS AND APPRAISALS OF THE MINNESOTA INTERNSHIP PROGRAM

Since certain mid-1950's graduates participated in the Ford-financed internship program, it seemed desirable to probe in some depth their attitudes toward such special training. The present chapter therefore provides further descriptive materials regarding the program and the interns' appraisals of the experiences involved.

The Minnesota Internship Program for College Teachers will be examined from two angles, namely as it was seen *at the time of the program* by the participating staff and interns and as it is *presently* perceived and evaluated. This permits comparisons not only of staff members' and interns' perceptions but of the latter's immediate and more mature impressions.

Descriptions and Early Evaluations of the Program

The internship program was an all-university endeavor, guided by a seven-man Graduate School Committee. Composed of the Dean of the Graduate School, representatives from the divisions of Humanities, Education, and the Behavioral and Natural Sciences, and the two executive officers[1], this committee helped to design the experiences involved. Within the broad framework set, individual departments proposed and administered programs suited to candidates in their own field.

Contributions of the Graduate School Committee

The Graduate School Committee was responsible, beyond its general sponsorship, for the screening and selection of interns and for operating a weekly seminar which all interns attended.

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[1]Dr. C. Gilbert Wrenn served as director of the program and Dr. Gordon M. A. Mork as executive secretary.

Screening Criteria: Judging from notations appended to the records of candidates who were accepted or rejected, four criteria were used:

1. Successful completion of the preliminary examination for the Ph.D.
2. Strong recommendation by the department faculty, including endorsing letters from the head of the department and the proposed sponsor of the intern.
3. Lack of experience in college teaching (interpreted to mean, in a few cases, not more than one year of full-time college teaching).
4. Additional qualitative criteria, including interest in teaching, a superior scholastic record, and presentation of a satisfactory proposal for intern and sponsor activity.

Selection of Interns: From approximately 100 candidates who applied for admission, thirty-three were selected—eight in 1953-1954, thirteen in 1954-1955, and twelve in 1955-1956. Among the nineteen fields represented, Political Science led with six candidates, followed by Speech and Theatre Arts (four) and Sociology (four). American Studies and Medicine each had three participants; English, Education, History, and Psychology two; and Child Welfare, Chemistry, Humanities, Philosophy, and Zoology a single candidate in this experimental program. Two women were included in the final year, but none in the earlier period.

Study of University files indicates that the rejected candidates had also shown a strong interest in teaching, were not inferior in academic standing, and had presented detailed proposals for use of such an opportunity. But generally they had had more teaching experiences than the accepted candidates, suggesting that the third criterion listed above ("lack of teaching experience") played a large role in selection.

The thirty-three interns were appointed as "Intern-Fellows" at the then-current beginning instructor salary of $3600 per year. Individual departments were asked to give them full instructor status, and this seems to have been uniformly done.

Intern Activities: A weekly seminar afforded the interns an opportunity to consider various issues, problems, and developments which should concern college faculty members. The director of the program and the executive secretary of the

Committee attended all meetings and, in cooperation with the interns, did the planning, invited the speakers, conducted the sessions, and evaluated the results.

Among the approximately thirty sessions conducted each year, some involved the use of guest lecturers or discussions of books relating to teaching, such as Highet's *Art of Teaching* and Cantor's *The Teaching-Learning Process.* A few others included reports from the interns on teaching goals and methods in their own departments. Still other sessions, led by the director, concerned such topics as philosophy of education, psychology of learning, and teaching methodology. Occasionally a visit to an administrative or service office, such as the University Counseling Bureau, substituted for a seminar session, to acquaint interns with facilities that might contribute to their students' learning. Some seminar sessions, held in the informal atmosphere of the director's home, exceeded in time the scheduled two-hour period.

Changes in seminar topics during these three years suggest that the early group of interns may have recommended more guest lecturers and discussions based on assigned readings, since these were used extensively in the 1955-1956 program. Throughout the three years, but especially in the final one, professors from many departments and divisions of the University led seminar discussions.

Departmental Contributions

Departmental staffs contributed in several ways to the interns' induction into college faculty service. Besides providing the interns with a classroom, students, and an experienced mentor, they invited them to departmental meetings and helped to arrange visits to other campuses.

Understudying an Experienced Teacher: All interns observed selected teachers in their departments, taught under supervision, and conferred with their faculty sponsor about their teaching. Many interns also revised units or entire courses and prepared lectures accordingly; some prepared teaching aids, tests, and other evaluative materials for one or more courses.

Induction to complete responsibility for a college class was usually a gradual process, initiated by having the intern observe his sponsor's teaching during the fall quarter. Conferences in which the sponsor explained what he hoped to ac-

complish often preceded these class visits. In the winter quarter the intern and sponsor typically alternated in teaching a specified class or two. The sponsor would attend most of the classes taught by the intern and later confer with him regarding strengths and weaknesses of the approaches used. In the spring quarter the intern assumed complete responsibility for one or more courses. The sponsor did not supervise these activities closely, but encouraged conferences with the intern about the latter's work.

Two-thirds of the departments provided the interns with an opportunity to teach different levels of their subject specialty, such as an introductory lower-division course and either an upper-division or graduate course. In such instances the interns typically worked with more than one sponsor. A few interns were given the opportunity to construct, under supervision, a new course in their field and then to test their ideas by teaching it.

Visits to Other Campuses: Each intern also spent from four to seven days each at two other colleges or universities. In every case the intern lived on campus, spent time with the host professor, visited with student groups, observed teaching, attended faculty meetings, and engaged in other relevant activities. These visits, which were also financed by the Ford Foundation, gave interns some experience on campuses quite different from Minnesota's.

In the first year of the program visits were limited to Minnesota, Wisconsin, and Iowa institutions. In the second year several eastern and one west-coast university were visited, while Ivy-league and other eastern colleges and universities predominated in the final year. The visits were arranged on an individual basis, with the choice of institutions left to the interns and their sponsors.

Evaluations During the Program

Some appraisals were made during the experimental program, though not on a systematic basis. It is difficult under these conditions to draw definite conclusions, since different types of instruments were used from year to year and some reports were missing from the files. Findings will be summarized relating to the seminar and other aspects of the program.

Appraisals of the Seminar: In the first year the forms used invited free responses, whereas in the latter two years checklists were employed. In all three years interns expressed a preference for discussions based on suggested readings relating to teaching problems that they themselves were experiencing. Receiving least favorable reaction were sessions concerned with general teaching methodology or broad topics such as the role of the college teacher in American society. In general, the interns liked the number and duration of sessions but suggested somewhat better planned and more practical topics.

Appraisals of Other Aspects of the Program: These appraisals, which were all of a free-response type, came from both interns and sponsors. Interns were particularly satisfied with experiences associated with understudying a teacher and visiting other campuses. Some thought they had been a little overworked. Others would have preferred more straightforward criticism. As one intern put it: "My sponsors weren't nearly specific enough in their criticism of my work. While I think on the whole they were satisfied, I still don't know what it was I did right or wrong, in their opinion." And one suggestion made was fairly general, "I would have preferred to have spent less time preparing to teach and more time actually teaching."

Sponsors' evaluations indicated that they were definitely satisfied with the program and that they had taken seriously their role of inducting new faculty members. "This type of program has been long overdue. . . . The University should continue it after the Ford Foundation withdraws its support." "I am convinced that this program will not only recruit college faculty members but also help these youngsters not to make the same mistakes all of us made when we began teaching." A few sponsors suggested that interns devote more time to developing materials for new courses.

Present Perceptions and Evaluations

In roughly ten years of subsequent teaching, persons in this experimental program had had extended opportunities to test the worth of the training received. Their current views on thirty-one experiences typically included in the program were therefore inventoried, with each respondent asked to rate individual items in terms of both observed and desired emphasis. Interns' current satisfactions with these experiences were also

explored and, where possible, compared with their attitudes a decade earlier. Finally, their views were sought regarding possible economics in or substitutes for the internship program.

Reactions to Internship Experiences

In order to compare ratings on the three-point scale provided for each descriptive statement, these were put on a scale with a lower limit of "0" and an upper limit of "100." If all interns had observed "much" emphasis, the value for that experience on the "observed-emphasis" scale was 100. If in contrast, all had noted "little or no" emphasis, its value was zero. A reading of 50 indicated "average" emphasis (either all thought "some" emphasis had been given, or equal numbers registered views above and below this point). The scale values for "desired emphasis" were computed similarly.

General Observations: In attempting to provide a wide range of experiences, the staff involved apparently did not give great emphasis to any aspect (see Table 20). Only a single experience, "observing my sponsor in his teaching" (observed-emphasis value of 67), was judged to have received substantial emphasis. "Discussing methods of teaching and the supporting research" ranked next, with an observed-emphasis value of 50. The other twenty-nine experiences received less emphasis, with many receiving a very little, as reflected in a median value of 30 for the entire list. Ranking lowest were "conferring with outstanding professors about their teaching" and "having other Minnesota faculty visit my classes" (observed-emphasis values of 16 and 3 respectively).

Although the interns appeared satisfied with practically all aspects of the program, they would have preferred more stress on most experiences (shown by a median value of 67 for the entire list). The one notable exception was "observing my sponsor in his teaching," which had headed the list in terms of observed emphasis and for which the interns now recommended about the same concern (desired-emphasis value of 48). In the case of the other thirty aspects investigated, they wanted more or much more stress, especially with respect to getting frank appraisals of their teaching and conferring with outstanding professors about it (desired-emphasis values of 80 and 79 respectively). Although interns liked the kinds of experiences they had had, they clearly wanted more stress on

TABLE 20

OBSERVED AND DESIRED EMPHASIS VALUES FOR THIRTY-ONE INTERNSHIP EXPERIENCES

The Experience	*Emphasis Value* Observed	Desired
Seminar Experiences:		
1. Discussing major educational philosophies	46	66
2. Discussing historical development of American colleges	21	66
3. Discussing the goals of "liberal" or "general" education	48	64
4. Discussing how to develop or revise a course	17	72
5. Discussing psychology of learning (what happens in the learning process)	29	54
6. Discussing characteristics of college students	20	57
7. Discussing methods of teaching and the supporting research	50	67
8. Discussing test construction (your own and standardized)	27	68
9. Discussing how a college is operated	43	70
10. Bringing in outside speakers	40	53
11. Having interns plan topics or activities	24	60
12. Making evaluations of seminar and other aspects of program	20	57
Teaching and Supervising Activities:		
13. Having my sponsor from the beginning visit classes I taught	43	59
14. Having my sponsor visit when I requested him to do so	22	67
15. Having other Minnesota faculty visit my classes	3	60
16. Conferring regularly with my sponsor to review plans and teaching materials	45	67
17. Getting frank appraisals of my teaching strengths and weaknesses	43	80
18. Teaching various levels of my subject area	48	73
19. Teaching classes of various sizes	38	68
20. Teaching with the aid of audio-visual materials	23	58
21. Observing my sponsor in his teaching	67	48
22. Observing other teachers at Minnesota	48	68
23. Observing teachers in other colleges in the Twin Cities	17	68
Visiting Other Campuses and Non-Classroom Activities:		
24. Reading suggested literature on college teaching	48	62
25. Participating in departmental meetings	20	67
26. Advising undergraduates	30	67
27. Visiting college faculty meetings	28	71
28. Observing classes in other Minnesota, Iowa, Wisconsin, and Dakota institutions	31	61
29. Observing classes in outstanding universities elsewhere	30	68
30. Conferring with outstanding professors about their teaching	16	79
31. Attending professional meetings with Minnesota professors	22	71

them and more feedback of information useful in their own teaching.

Seminar Topics: Of the nine seminar topics appraised, the four which interns judged had received the most attention were: (a) methods of teaching and the supporting research, (b) the goals of a "liberal" or "general" education, (c) major educational philosophies, and (d) the operation of a college, with observed-emphasis values of 50, 48, 46, and 43 (well above the median value of 30 for the entire list). The four "desired-emphasis" values for these same items were still higher, hovering around the median (67) for all experiences.

The other five topics had received, the interns thought, relatively little emphasis (midway between "little" and "some"). Discussions of the psychology of learning and of test construction received observed-emphasis values of 29 and 27. The interns suggest about the same emphasis on the former topic (54) [2] and more on the latter (68). The least emphasized topics were, in their judgment, the historical development of the American college (21), characteristics of college students (20), and ways of developing and revising college courses (17). The interns would have liked more emphasis on all three topics, especially on curriculum development, which received the highest recommendation (72) among the seminar topics listed and the fourth highest for the entire list.

Seminar Procedures: The interns felt that they had had little voice in planning seminar topics or activities (they gave this a low observed-emphasis value of 24), and that scant attention had been given to evaluations of the seminar or other aspects of the program (20). Most gave "some emphasis" ratings to the use of outside speakers (40).

Their appraisals reveal a desire for more emphasis on all three of these procedures. However, their desires here are not as pronounced as for most other experiences, for the desired-emphasis values (60, 53, and 57) were all below the median for the thirty-one types of activities.

Teaching and Supervising Activities: Of eleven experiences (#13 to 23 of Table 20) which concern departmental teaching assignments, interns thought that seven had been emphasized to some degree and four only slightly. Most often stressed was

[2] Here and subsequently, numbers in parentheses indicate the emphasis value, either desired or observed as revealed by the context.

the interns' own observation of their sponsors' teaching (67). On six other items—observing the teaching of other Minnesota faculty (48), teaching various levels of subject area (48), conferring regularly with the sponsor (45), obtaining frank appraisals of teaching strengths and weaknesses (43), receiving frequent visits from sponsors during initial teaching (43), and teaching classes of various sizes (38)—the ratings were well above the median (30) for the entire scale. But the four remaining experiences had apparently received only slight emphasis: teaching with the aid of audio-visual materials (23), receiving supervisory visits from sponsors when interns requested this (22), observing classes taught in other local colleges (17), and receiving supervisory visits from other Minnesota faculty (3). Only one intern thought that "some" emphasis had been given to this latter point.

Recommendations concerning these eleven experiences reveal, first of all, that the interns were generally enthusiastic about this aspect of the program. They desired more opportunities to observe the teaching of experienced professors other than their sponsor and to have their sponsor observe their teaching and give them frank appraisals. They also would have welcomed, in retrospect, more extensive and varied teaching assignments. Seven of these eleven experiences ranked at or above the median (67) for the entire list, with the two most highly sought experiences involving "receiving frank appraisals of teaching strengths and weaknesses" (80) and "teaching various levels of subject area" (73).

Visiting Other Campuses and Non-Classroom Activities: Eight items canvassed reactions to visits to other colleges and universities and such non-classroom activities as participating in departmental and faculty meetings, advising undergraduates, and reading suggested literature on college teaching (cf. #24 to 31 of Table 20).

The interns were apparently urged to do some reading on college teaching (48) but substantially less emphasis was given to observing classes in other neighboring (Minnesota, Iowa, Wisconsin, and Dakota) institutions (31), observing classes in outstanding colleges or universities elsewhere (30), advising undergraduates (30), and attending college faculty meetings (28). Receiving least attention were attending professional meetings with Minnesota professors (22), participating in departmental meetings (20), and conferring in visits to other

campuses with outstanding professors about teaching problems (16).

The interns would have preferred more stress on all eight of these experiences, with strong emphasis given four, namely, talking with distinguished professors about their teaching (79), attending professional meetings with Minnesota professors (71), attending college faculty meetings (71), and observing classes in leading colleges or universities (68).

Satisfaction with the Internship Experience

Judging from records currently available, the interns apparently had not been asked to express their general satisfaction with the program, either during its operation or at its conclusion. But in the summer of 1965 they were invited not only to indicate their present views but to try to recall those they had held a decade ago. The results, reported in Table 21, indicate that the interns are and were in general quite satisfied with the program. No one was "very dissatisfied," and very few classified themselves as formerly (10 per cent) or presently (6.7 per cent) "somewhat dissatisfied." Most judged that they were either "moderately satisfied" (30 per cent at the time of the program and 46.7 per cent presently) or "very satisfied" (46.7 and 26.7 per cents respectively), indicating some shift toward the "moderate" view recently. Five interns (16.7 per cent) are now "extremely satisfied" with the internship, three of whom thought they had this opinion a decade ago.

When ratings are compared, average satisfaction for both time periods is exactly the same (between "very satisfied" and "moderately satisfied," with a leaning to the former). In general, the degree of satisfaction that an individual intern thought that he felt ten years back is very close to his current attitude.

TABLE 21

INTERNS' SATISFACTION WITH THE MINNESOTA INTERNSHIP PROGRAM BOTH DURING ITS OPERATION AND PRESENTLY

Degree of Satisfaction	At the Time of the Program Per Cent	A Decade After Per Cent
1. Extremely satisfied	10.0	16.7
2. Very satisfied	46.7	30.0
3. Moderately satisfied	33.3	46.7
4. Somewhat dissatisfied	10.0	6.7
5. Very dissatisfied	.0	.0

Obviously the Minnesota internship was a satisfying experience, and the favorable attitudes that most participants had have not diminished in the past decade.

Most and Least Valuable Aspects of the Program

Two free-response questions included in the recent inventory asked interns to list the most and least profitable aspects of the program. These reactions, which ranged from a phrase to a carefully delineated critique, gave additional support to the foregoing appraisals. Half (15) of those responding valued most highly experiences which could be summarized as "the opportunity to understudy a teacher" (including nine who gave "supervised teaching and sessions with my sponsor," five who listed "understudying a teacher," and one who cited "the opportunity to learn about teaching through practical experience"). The other fifteen answers included: "the opportunity to teach advanced courses" (6), "discussions which showed the viewpoint of those from different disciplines" (5), "visits to other campuses" (2), "time to read and think about teaching" (1), and "flexibility of the program" (1).

When asked to identify the "least profitable" aspect, which should be changed if the program were repeated, six interns suggested no changes. Nineteen of the remaining twenty-four mentioned the seminar or some aspect of it. These included eight who laconically listed "the seminar," two who simply said "certain seminar topics," and nine who tried to pinpoint these. Comments on the latter included "discussions of ideal learning conditions" (2), "discussions of administrative processes at Minnesota" (2), "educational theory" (2), "psychology of learning and educational aids" (1), "outside speakers" (1), and "intern reports" (1). The other five interns cited "heavy teaching load" (2), "auditing education courses" (1), "no continuity between the experiences of interns" (1), and "sponsors were not brought into the program" (1).

Appraisals in this section lend themselves to definite conclusions. In the participants' opinion the strongest part of the program was the opportunity to understudy a teacher; the weakest part concerned the seminar.

Economies and Substitutes

Since the Minnesota internship program was expensive, the University likely could not offer a similar program without

outside support or making certain drastic economies in operation. Confronted with a list of practices which could reduce the cost, interns were asked to identify any that, in their judgment, could be adopted without actually weakening or destroying the essential character of the program.

Though these former interns' responses are not very helpful in identifying possible economies, they confirm the satisfaction which they had with the program. Half rejected all six economies (Table 22), with the protest strongest when the suggested economy would involve expense to the intern. They also strongly opposed any weakening of the relationship that existed between themselves and their sponsors. Less objectionable was some reduction in the number or distance of visits to other campuses and the number of outside speakers for the seminar.

TABLE 22

INTERNS' ATTITUDES TOWARD SUGGESTED ECONOMIES IN SUCH PROGRAMS

Type of Economy	Number of Interns Who Approve	Disapprove
1. Reduce number or distance of visits to other campuses	15	15
2. Reduce the number of outside speakers for seminar	13	17
3. Make seminar chiefly a meeting of interns to discuss teaching problems	11	19
4. Reduce the time a sponsor spends with intern	8	22
5. Have interns pay for some of the expense of visits to other campuses	7	23
6. Pay interns a salary based on hours they actually teach	6	24

The interns were also presented with seven training programs that would be less expensive than the internship, and asked to indicate whether they would consider the proposed program a "good," "fair," or "poor" substitute.

"A supervised-teaching experience as part of the graduate program" was the most highly rated substitute, with "a supervised-teaching experience, along with some related course work" also quite popular (see Table 23). Interns were least confident about the calibre of supervision they might receive in their first employing institution. A preference is again revealed for university-sponsored teaching experiences, and less

TABLE 23

INTERNS' ATTITUDES TOWARD POSSIBLE SUBSTITUTES FOR AN INTERNSHIP PROGRAM

Substitute Experience	Number Rating Good	Fair	Poor
1. A supervised-teaching experience as part of your graduate work	17	8	4
2. A supervised-teaching experience along with related course work	13	8	8
3. A continuing inservice program of faculty discussion and study of teaching problems	8	15	7
4. A teaching assistantship in the graduate school	6	16	6
5. A seminar for new teachers at an employing institution	6	14	10
6. A course in college teaching while in graduate school	6	8	15
7. Some supervision of initial instruction at an employing institution	5	9	16

optimism over the possible yield of courses or seminars on college teaching or training afforded by the employing institution.

Summary

Individual departments and a Graduate School Committee contributed to the internship program in college teaching conducted at the University of Minnesota between 1953 and 1956 under a grant from the Ford Foundation. Included were a seminar and guided readings on college teaching and its problems, an opportunity to understudy a teacher in the candidate's own department, and visits to other colleges and universities.

Materials collected, both at the time of the program and recently, reveal that interns were typically quite satisfied with the experience. They liked, and in many cases were enthusiastic about, what they got, but felt that many elements or aspects should have received more attention. Satisfaction was greater with those aspects to which individual departments contributed (the opportunity to observe quality teaching, to teach under supervision, and to have frequent conferences) than with the Graduate School Committee's contribution, which took the form of a weekly seminar.

If the program were to be repeated, the interns recommend essentially the same type of program but suggest certain changes in seminar topics and procedure and still more stress on

understudying a master teacher. Should economies necessitate a substitute program, the interns suggest some form of supervised teaching in the graduate school as most beneficial. They would definitely prefer this to an internship during the first year in an employing college or university.

Chapter V

MAJOR FINDINGS AND IMPLICATIONS

This investigation of persons who had received Minnesota Ph.D. degrees was aimed at discovering their current jobs, other professional activities, and views regarding their graduate programs, and relating these facts and opinions to certain important differences in their preparation and later work status. Limited to degree holders from one institution, the two reported studies were based on persons granted Ph.D.s in 1954-56 and studied a decade later, and on 1935-48 recipients studied in 1950, or typically also about ten years later. They were essentially exploratory in character, for few follow-up studies of Ph.D.s have been made and no other reported investigation has been as comprehensive in scope or has attempted to test relationships, over a considerable period of time, between training patterns and present attitude and performance variables.

Information for both studies was secured through a four-page printed questionnaire, returned by 90 per cent of the contacted graduates or about 86 per cent of all those awarded doctorates in the selected years. Thirty interns in college teaching, or nine-tenths of those who held such appointments in an experimental program conducted in the mid-1950's, supplied information regarding it through an additional three-page blank. These data were coded and analyzed in appropriate ways, including use of 89 chi-square tests to check relationships for the 1954-56 Ph.D.s between responses given and the three principal variables explored, namely major field, preparation received for college teaching, and type of present employment. Findings and conclusions from the 1954-56 study will be briefly reviewed in this chapter, along with some limited but highly relevant data from the earlier investigation, and recommendations made regarding graduate school programs and needed research on their purposes, procedures, and achievements.

Results of the Study

The Graduate School at the University of Minnesota offers a wide range of experiences aimed at preparing research

scholars and college teachers. The 708 graduates of the mid-1950's, for example, could have specialized in any one of over a hundred major fields, could have included courses in higher education in their programs, and could have applied for admission to a special internship program in college teaching financed by the Ford Foundation. As the findings for the 1954-56 study show (and percentages were closely similar for earlier years) over 38 per cent of the candidates had majored in Social Ecologies, Humanities, and Behavioral Sciences; 42 per cent in Agricultural, Biological, Chemical, and Other Physical Sciences; and 20 per cent in the professional fields of Education and Medicine. For the more recent period, when such special opportunities were provided, approximately 17 per cent had taken one or more courses in higher education, and five per cent had held an internship in college teaching. In addition, 40 per cent had done some pre-graduation teaching.

The findings summarized below relate to these Ph.D.s' present activities and job satisfactions, their appraisals of their graduate school experiences, and also to special evaluations which the former interns made of their preparation for college teaching. Although many relationships were explored and discussed in earlier chapters, only the more significant findings are given here.

Present Activities and Job Satisfactions

1. Minnesota Ph.D.s have entered a variety of occupations, but predominantly as teachers, researchers, and administrators in colleges and universities (67 per cent). Many others supervise or participate in research projects for industry and government (29 per cent).

2. Almost all candidates in some fields of specialization (Humanities and Social Ecologies) are now affiliated with colleges and universities; in others (Chemical and Other Physical Sciences) a large per cent are employed in business and industry.

3. A significantly higher per cent of interns and of those who had taken courses in higher education are now on college and university staffs.

4. The average Ph.D. graduate divides his work time almost equally among teaching, research, and administrative duties. This varies notably from earlier faculty load stud-

ies, where a much smaller proportion of time was reportedly invested in research and administration. In general, those employed in government and those who had majored in Biological, Agricultural, and Chemical Sciences devote a great deal of time to research. Conversely, college staff members and former Humanities and Social Ecologies majors devote large percentages of their work time to teaching, whereas administrative activities predominate in the work patterns of former Education majors and of those employed in business and industry.

5. Minnesota Ph.D.s who joined academic staffs judge that they did so because of this career's intellectual challenge, flexible work schedule, and opportunities afforded for research. The few who left attribute this to financial reasons or to a belief they could contribute more fully to society in other ways.

6. Minnesota Ph.D. recipients seem to be stable employees. Almost half have been at their present job since graduating in the mid-1950's, and the group as a whole has averaged only two jobs since leaving the University.

7. A significantly larger per cent of those Ph.D.s who had special preparation for teaching (internship or courses in higher education) are not only presently occupied with teaching activities but have identified with and feel competent in this profession.

8. Persons granted Minnesota Ph.D.s have subsequently done considerable scholarly writing. More than half have published their thesis; almost the same per cent have written other books or monographs. The typical Ph.D. recipient has also contributed about seven articles in the last ten years, which is a distinctly higher figure than those reported in studies of Ph.D.s elsewhere. There is a significantly higher incidence of publishing among persons on university staffs and in governmental positions than among those affiliated with independent colleges or other agencies.

9. These Ph.D. graduates are taking an active role in professional activities, for they belong to 3.5 professional societies, on the average, and most have held office in a regional or national association.

Graduates' Appraisals of Ph.D. Experiences

1. Some graduate school goals are strongly endorsed, whereas the stress given during graduate training to certain others seems to be out of line with the current desires, interests, and job activities of Ph.D. recipients.

   a. *Goals Pertaining to Professional Development*: In the opinion of these graduates, two received very strong emphasis and rightly so, since they related to command of the major field and acquaintance with professional literature. But certain others could have received, in these graduates' judgments, a little less attention, and two of them (relating to the language requirement and minor field) considerably less. Type of present employment was not significantly related to graduates' appraisals on these points, nor were major field or type of preparation received for teaching to estimates of attainment of these objectives.

   b. *Goals Pertaining to Administrative Relationships*: Those in all five types of employment studied strongly agreed on the usefulness of these goals and thought that all but one ("ability to appraise professional contributions") could have received more emphasis, and "skill in delegating work" considerably more stress. Groups classified on the basis of field of concentration or preparation for teaching quite uniformly felt that these were not satisfactorily attained in the graduate school.

   c. *Goals Pertaining to Research*: Research training is greatly stressed at Minnesota and properly so since this pertains to the very nature of the Ph.D. degree and has obvious career utility. Nonetheless, graduates generally felt that all but one goal ("ability to supervise research programs") had received more emphasis than is warranted by their on-the-job usefulness. A large percentage of candidates in all major fields felt that they had acquired these skills, and this was also true of groups classified according to preparation received for college teaching.

   d. *Goals Pertaining to Teaching*: All but one ("ability to make and use illustrative devices") could have re-

ceived more emphasis in the opinion of these graduates. Three of these goals—"ability to outline objectives and organize courses," "skill in planning the use of class time," "skill in lecturing"—should, in these graduates' estimation, have received considerably more attention. Persons in all types of employment had found the listed abilities useful, but a significantly larger per cent of those in certain subject fields, notably Clinical Medicine, Education, Social Ecologies, and Humanities, and of those with internship training or courses in higher education, felt that they had acquired the implied skills or knowledge in their graduate training.

e. *Goals Pertaining to General Education*: Graduates thought that all but one ("knowledge in a collateral field") had been given little attention in their graduate studies. "Possession of a satisfying philosophy of life" should have received, graduates believed, notably more emphasis. Significantly larger percentages of graduates in Clinical Medicine, Education, and Social Ecologies than in other fields believed that they had attained in some measure these general education goals, but no differences emerged among persons with various degrees of preparation for college teaching.

2. Recent graduates' opinions regarding the specific competencies needed in their present jobs were strikingly similar to those expressed by persons awarded the Ph.D. in the earlier period studied (1935-48). But the 1954-56 Ph.D.s were significantly more satisfied than earlier graduates with contributions the Graduate School had made toward their attainment. Impressive gaps still remain, as noted above, between desired emphasis and judged attainment of many of these goals, particularly those relating to teaching, but the findings suggest definite progress during the years studied. Both through formal provisions, such as the internship program and the offering of courses and seminars in higher education, and through increased efforts in some departments to cultivate candidates' interest and skill in teaching, substantial strides have evidently been made in this direction. Whereas the current evaluations afford no grounds for complacency, they suggest that Minnesota's doctoral

program—and probably graduate education generally—have been improving in these directions more than many strident critics of Ph.D. programs have recognized.

3. Minnesota Ph.D.s, whatever their field of specialization or present employment, generally favor more breadth in course work and thesis topics, more preparation for teaching, and a reduction in the time it takes to complete the Ph.D. Many suggest that the latter be accomplished, at least in part, by viewing the thesis as a "trial run" rather than as a major contribution. Most graduates do not see any pressing need to integrate undergraduate and graduate work or to modify the format of the dissertation or final oral examination. Graduates of the earlier period (1935-48) also strongly favored more emphasis on teacher training during graduate years. But they saw relatively more value than graduates of the mid-1950's in the traditional minor and less in programs stressing breadth.

4. These Ph.D.s were in general very satisfied with their graduate programs. Approximately 82 per cent thought they had had a strong academic program, and 90 per cent cited "outstanding teachers." Satisfaction with the program as a whole was greatest among certain graduate school majors, notably those in Clinical Medicine and Education, and among those who had special preparation for teaching gained through an internship experience or courses in higher education.

Interns' Appraisals of Their Special Program

1. The interns were generally satisfied with the program they experienced, which included a weekly seminar on college teaching problems and related topics, an opportunity to teach one or more levels of college classes under supervision, and provision to observe the instructional efforts on at least two other campuses. Satisfaction was greatest with experiences contributed by the individual departments in planning and guiding their teaching activities.

2. The most profitable aspect of the program, according to these former participants, was the opportunity to understudy a good teacher. Also given high ratings were ob-

serving superior teaching, having a sponsor supervise intern teaching, and getting frank appraisals of teaching strengths and weaknesses.

3. Although the interns were more strongly convinced of the value of the supervised-teaching aspect of the program, they were not dissatisfied with the seminar. Some interns suggested modifying certain seminar topics, particularly those concerned with general pedagogy. When discussions applied to practical teaching problems or were based on specific reading material, interns' approval was strongest.

4. If economies or substitute programs are necessary, the interns suggest some form of supervised teaching during graduate years as most characteristic of the program they experienced and enjoyed. They would definitely prefer this to an inservice internship.

Conclusions

1. *The Graduate School of the University of Minnesota has fulfilled well its function of preparing research scholars.*

   A high per cent of graduates, regardless of their field of specialization, judged that they had acquired skills pertaining to research and have demonstrated by their own later scholarly publications that this confidence is justified.

2. *The Graduate School has given much less emphasis to developing skills and abilities needed for teaching and administrative roles and to promoting the general-liberal education of candidates, although its contributions here increased significantly during the years studied.*

   Relatively small percentages of graduates even in more recent years judged that they acquired the skills, insights, and outlooks typically associated with such training, which contrasts markedly with the substantial—and often impressive—percentages of graduates in all type of employment who find them necessary. Had the values of further liberal education for non-vocational roles been explored, there likely would have been a still greater disparity between the judged usefulness and stress given these goals in graduate training. However, as previous analyses have shown, the

more recent situation is considerably more hopeful than that revealed in the initial (1935-48) Ph.D. study.

3. *Most Ph.D.s join academic staffs and would like to have received more explicit graduate preparation for their oncoming tasks.*

   Two-thirds (67 per cent) of Minnesota Ph.D. recipients are employed in colleges and universities; 63 per cent are engaged in teaching, and 61 per cent agree that appropriate training for this function should be given in the graduate school.

4. *Efforts to provide candidates with some preparation for later faculty service through an internship or through courses in higher education have met with substantial success.*

   Significantly higher percentages of candidates who had such experiences than of graduates at large judged that they had acquired important teaching skills and chose, identified with, and felt more successful in their teaching role than their untrained colleagues did.

5. *Future internship programs at Minnesota should provide many of the experiences included in the 1953-56 program.*

   Interns were very satisfied, at the time, with these programs, and their enthusiasm has not waned appreciably in the past ten years. Pleased with the variety and flexibility of the program, their suggestions principally concern the emphasis to be given to various experiences rather than any marked changes in the types involved. In their judgment, chief stress should be given to the process of understudying a master teacher and less to study and discussion of certain seminar topics.

The first three conclusions are supported not only by the two Minnesota studies of Ph.D. recipients but by similar surveys made in the last ten years at other Ph.D.-granting institutions.

Recommendations and Suggestions for Further Study

A few recommendations concerning graduate school and individual departmental policies follow, along with suggested ways to extend research in this newly charted area, dealing

with the later activities, attitudes, and values of persons awarded the highest earned degree.

Recommendations Concerning Graduate School and Departmental Policy

Those responsible for graduate school policy should:

1. Commend all departments on the progress made in the last few decades toward recognizing the professional needs of candidates and tailoring programs to meet these needs. Although laurel-resting should never be encouraged in a constantly evolving institution, distinct advances are worthy of recognition.

2. Encourage these same departments to study the later career needs of candidates and to extend further the experiences aimed at meeting these. Since gaps were most noticeable in the preparation of college teachers, departments which produce large proportions of college and university staff members should be strongly encouraged to explore departmental and all-university programs aimed at producing scholar-teachers. Such programs could well include courses, seminars, supervised-teaching experiences, an internship in college teaching similar to the 1953-55 Ford model, and any other programs proven effective for this purpose.

3. Work closely with departments that send many graduates into administrative positions to investigate whether preparation for such oncoming tasks could best be provided in the graduate school or through post-doctoral studies or inservice training.

4. Continue, with the help of individual departments, to develop interdisciplinary seminars, encourage use of related courses in two or three fields for the traditional minor where such substitution is appropriate, and establish on an experimental basis some graduate courses that promise to extend the general-liberal education of persons bound for the University's highest degree.

5. Increase alternatives for the language requirement. Most departments presently allow certain collateral fields as alternatives for one language. These sequences could be

increased in number, made more attractive, and even allowed to substitute in selected instances for both language requirements.[1]

6. Provide every ten years or oftener for follow-up studies of degree holders, to investigate the progress of graduate school efforts and to verify the claims of recently inaugurated experimental programs. The American public rightly looks to its graduate schools for leadership in research activity, and this should clearly include critical appraisals of these schools' own programs of advanced study.

Those responsible for policy in individual departments should study the subsequent careers of their graduates, incorporating relevant findings of the present investigation with those resulting from special studies made by the departments involved, and modify programs imaginatively in ways likely to meet projected needs. Departments in which a large percentage of candidates enter teaching careers could well consider the following modifications:

1. Inaugurate integrating courses that would help candidates relate their knowledge and communicate it in a unified way.
2. Initiate a series of discussions of college and university problems within individual departments or for candidates in related fields or recommend that certain candidates take courses in higher education available on an all-university basis.
3. Require all candidates to teach under supervision at least one class in the field of their specialization.
4. Encourage more attention in doctoral dissertations to exploring the theoretical or conceptual basis of the study undertaken, to analyzing and interpreting existing knowledge regarding the problem, and to assessing the meaning of the findings—all tasks that teachers must constantly perform.

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[1]The Graduate School took action (in 1968) allowing thorough mastery of one foreign language to substitute for levels of proficiency currently expected in two languages, or in one language plus a collateral field.

Areas for Further Study

1. Studies similar to the present one should be made on divisional and departmental bases. By focusing on specific groups, more relevant and precise information could be gathered about candidates' graduate school and current experiences. As an example, appraisals from all majors in the Social Ecologies are useful, but those made by Ph.D.s in Economics, Geography, Law, History, and Political Science (departments of Social Ecologies) would be more valuable and more easily translated into suggestions for the departments involved. Studies of the type that Perkins and Snell (28) have made of the education of historians and Hartung (20) of biologists should be instituted in many fields.

2. Longitudinal studies are urgently needed to assess attitudes toward teaching and other scholarly activities that candidates have before and after various types of graduate programs. Since many of the present findings reflect *selection* as well as *training* influences, more should be discovered about the characteristics and attitudes of persons attracted to various subject fields or to programs of teacher-preparation. Periodic follow-ups would then disclose attitudinal changes and also throw light on where many persons, not specially prepared for teaching or other careers during graduate years, received relevant training, e.g., on the job or by means of summer institutes, informal readings, discussions, and the like, which were not explored in the present study.

3. Another fruitful area for research would involve matching graduates' preparation for teaching or other professional services with measures of their later competence in these roles. For example, studies utilizing later student or colleague ratings of persons who had internships, received other preparation for teaching, or had no specific orientation to their instructional responsibilities would be most helpful. Still more significant would be studies that probed relationships between such patterns of training and the extent and quality of learning in classes taught by the persons involved. Studies relating training for research to later scholarly productivity would be equally illuminating.

The present study has collected and summarized a great deal of information about persons awarded Minnesota Ph.D. degrees, but with emphasis on their later professional roles and their perceptions of the values of their graduate school experiences, including whatever preparation they received for college and university teaching. It has thus attempted to provide graduate divisions with information helpful in assessing their present accomplishments and in charting their future programs. As these groups submit their purposes and accomplishments to continuing review, they will more clearly define and fulfill their special mission. Operating always "on the edge of tomorrow," graduate faculties help shape the future by their own research but preeminently through their development of highly knowledgeable, imaginative, and dedicated younger scholars.

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